



# MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

## COURSE PLAN

Department	:	Computer Science and Engineering			
Course Name & code	:	Advanced Computer Networks, & CSE 5151			
Semester & branch	:	I M.Tech, & CSE/CSIS			
Name of the faculty	:	Dr. Prema K V			
No of contact hours/week:		L	T	P	C
		3	1	0	4

## Course Outcomes (COs)

At the end of this course, the student should be able to:		No. of Contact Hours	Marks
CO1:	Analyse different UAV routing protocols.	10	21
CO2:	Identify SDN usecases and recognize SDN controllers.	12	25
CO3:	Identify different types of Data Centers.	8	17
CO4:	Analyse and apply different multimedia networking techniques.	8	17
CO5:	Recognize WDM network elements and network survivability.	10	20
Total		48	100

### Assessment Plan

Components	Assignments	Sessional Tests	End Semester/ Make-up Examination
Duration	20 to 30 minutes	60 minutes	180 minutes
Weightage	20 % (4 X 5 marks)	30 % (2 X 15 Marks)	50 % (1 X 50 Marks)
Typology of Questions	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation	Knowledge/ Recall; Understanding/ Comprehension; Application	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation
Pattern	Answer one randomly selected question from the problem sheet (Students can refer their class notes)	MCQ: 10 questions (0.5 marks) Short Answers: 5 questions (2 marks)	Answer all 5 full questions of 10 marks each. Each question may have 2 to 3 parts of 3/4/5/6/7 marks
Schedule	4, 7, 10, and 13 <sup>th</sup> week of academic calendar	Calendared activity	Calendared activity
Topics Covered	Quiz 1 (L 0-7 & T 0-1 ) (CO1)	Test 1 (L 0-18 & T 0-3 ) (CO1-2)	Comprehensive examination covering full syllabus. Students are expected to answer all questions (CO1-5)
	Quiz 2 (L 8-18 & T 2-3 ) (CO1-2)		
	Quiz 3 (L 19-31 & T 4-6 ) (CO2-4)	Test 2 (L 19-35 & T 4-7 ) (CO2-4)	
	Quiz 4 (L 32-41 & T 7-8 ) (CO4-5)		

### Lesson Plan

L. No.	Topics	Course Outcome Addressed
L0	Introduction to Advanced Computer Networks. UAV basics, UAV applications.	CO1
L1	Classifications of UAVs, history of UAVs.	CO1
L2	UAV network features, challenges, advantages.	CO1
L3	MANET, VANET, UAV comparative study, categorization of UAV networks.	CO1
L4	Self-organization in UAV networks, UAV static routing protocols: LCAD	CO1
L5	UAV static routing protocols: MLHR, Data centric	CO1
L6	Proactive UAV routing protocols: OLSR, GSR	CO1
L7	Proactive UAV routing protocols: FSR, DSDV, WRP	CO1
L8	On Demand UAV routing protocols: DSR, AODV	CO1
L9	Hybrid Routing Protocols: ZRP, TORA	CO1
L10	Geographic 3D routing protocols, Handover in UAVs.	CO1

L11	Software Defined Networking: Introduction, Conventional versus SDN approach.	CO2
L12	SDN architecture, layers.	CO2
L13	SDN facilitated server virtualization and cloud networks, policy-based automation related to SDN.	CO2
L14	Benefits and Use Cases of SDN, SDN Automation Leading to Business Agility.	CO2
L15	A new approach to network policy, Centralized policy management with distributed control points.	CO2
L16	Use Cases for Deploying SDN. Opflex protocol.	CO2
L17	Expanding Beyond the Network and the Data Center. Understanding SDN Technology.	CO2
L18	SDN controllers, policies, Overlay Networks in SDN Environments	CO2
L19	VXLAN, Automating Cloud via SDN, Open stack protocol. Key SDN Considerations and Requirements.	CO2
L20	Keeping things Open, Ten Important Facts about Evaluating SDN Solutions.	CO2
L21	Cloud Automation tools, choosing an Open source SDN platform.	CO2
L22	East-West Communication.	CO2
L23	Data Center Evolution: A History of the Modern Data Center.	CO3
L24	The Rise of the Monolithic Storage Array, The Virtualization of Compute — Software Defined Servers.	CO3
L25	The Fall of the Monolithic Storage Array, The Emergence of Convergence, The Role of Cloud.	CO3
L26	Cloud Types, Cloud Drivers. Emerging Data Center Trends: The Emergence of SDDC.	CO3
L27	Commoditization of Hardware, Shift to Software Defined Compute, Storage, Networking.	CO3
L28	Security, The Parallel Paths of SDS and Hyperconvergence.	CO3
L29	The Details of SDS, Hyperconverged Infrastructure.	CO3
L30	The Relationship Between SDS and HCI, Where are We Now?	CO3
L31	Multimedia Networking Applications; Properties of Video, and Audio, Types of Multimedia.	CO4
L32	Streaming Stored Video, UDP Streaming.	CO4
L33	HTTP Streaming, Adaptive Streaming and DASH.	CO4
L34	Content Distribution Networks, Case Studies. Voice-over-IP.	CO4
L35	Limitations of the Best-Effort IP Service, Removing Jitter at the Receiver for Audio, Recovering from Packet Loss, Case Study.	CO4
L36	Protocols for Real-Time Conversational Applications, Real Time Potocol (RTP), Session Initiation Protocol (SIP).	CO4
L37	Network Support for Multimedia, Dimensioning Best-Effort Networks, Providing Multiple Classes of Service.	CO4

<b>L38</b>	Diffserv, Per-Connection Quality-of-Service (QoS) Guarantees, Resource Reservation and Call Admission.	CO4
<b>L39</b>	Introduction to Optical Networks : Telecommunications Network Architecture, Services, Circuit Switching .	CO5
<b>L40</b>	Packet switching, changing services landscape, multiplexing techniques.	CO5
<b>L41</b>	Second-Generation Optical Networks, Optical Layer Transparency and All-Optical Networks.	CO5
<b>L42</b>	Optical Packet Switching, Wavelength Standards, Optical Power and Loss.	CO5
<b>L43</b>	Network, Evolution, Optical Amplifiers and WDM. Beyond Transmission Links to Networks.	CO5
<b>L44</b>	Optical Line Terminals, Amplifiers, Add/Drop Multiplexers, OADM Architectures.	CO5
<b>L45</b>	Reconfigurable OADMs, Optical Cross connects, All-Optical OXC Configurations.	CO5
<b>L46</b>	Network Survivability: Basic Concepts, Self-Healing rings, Protection in the Client Layer.	CO5
<b>L47</b>	Protection in Resilient Packet Rings, Protection in MPLS.	CO5
<b>L48</b>	Why Optical Layer Protection, Service Classes Based on Protection.	CO5
<b>L/T</b>	Click or tap here to enter text.	

### References:

1. <https://nptel.ac.in/courses/106105160/18> (Accessed on 2/2/2019).
2. Brian Underdahl and Gary Kinghorn, "Software Defined Networking For Dummies", Cisco Special Edition, John Wiley & Sons, Inc., 2015.
3. Scott D. Lowe, James Green, and David Davis, "Building a Modern Data Center: Principles and Strategies of Design", ActualTech Media, USA, 2016.
4. James F. Kurose, Keith W. Ross, "Computer Networking-A Top Down Approach", (6e), Pearson, 2013.
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Submitted by: **DR. PREMA K V**

(Signature of the faculty)

Date: 27-07-2019

Approved by: DR. ASHALATHA NAYAK

(Signature of HOD)

Date: Click or tap to enter a date.

**FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):**

FACULTY	SECTION	FACULTY	SECTION

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