Version 0619-5

Consolidated Academic Administration Plan for the Course

Computer networks– Sem. V
Computer Engineering – 2019-2020 – Odd. Semester
Prof. Sachin Deshpande (Cluster Mentor)
Prof. Amit Nerurkar, Prof. Amit Aylani

The academic resources available in VIT –

VMIS (ERP)	V-Refer and V-Live	VIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VIT

1.a Course Objectives (write in detail – follow NBA guideline in this regard)

Cognitive	What do you want students to know?	Layering principles, protocols and their roles
Affective	What do you want students to think / care about?	Various protocols, the need, purpose and applications
Behavioural	What do you want students to be able to do?	Client-server application Working of routing protocols using tools Subnetting (CIDR)

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.
http://vidyalankarlive.com/vrefer/index.php/apps/files/?dir=/vRefer/CMPN/SEM%20V/2019 20/CN/AKN/UniversityPaperSolution/FacultySolution&fileid=149817

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	To understand the need of layered network architecture and identify the functions of each layer in the OSI and TCP/IP models.	1,2,3,4,5,6
CO2	Demonstrate the knowledge of networking protocols at data link layer.	3
CO3	Design the network using IP addressing and subnetting / super netting schemes.	4
CO4	Analyse various routing algorithms and protocols at network layer.	4
CO5	Analyse transport layer protocols and congestion control algorithms.	5
CO6	Explore protocols at application layer .	6

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	S	-	W	M	-	-	-	-	-	-	-	-
CO 2	M	S	W	-	W	-	-	-	-	-	-	-
CO 3	-	M	S	M	-	W	-	-	-	-	-	-
CO 4	M	S	W	-	-	-	-	-	-	-	-	-
CO5	M	S	W	-	-	-	-	-	-	-	-	-
CO6	W	S	-	-	-	W	-	M	-	-	-	W

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3
CO 1	S	M	W
CO 2	S	M	W
CO 3	M	S	W
CO 4	S	W	W
CO5	S	W	W
CO6	M	M	W

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Mathematics	Basic Science & General Engg.	Humanities & Soft Skill	Core Engg./ Technology - Design & Analysis	Multidisciplinary
Tick suitable category				√	

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
CSC503	Computer Networks	4	2	-	4	1	-	5

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
CSC503	Computer Networks	20	20	20	80	25	25	-	150

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
A	AKN (4)	AKN	AKN	AKN	AKN	-	-	-	-
B	AKN(4)	AKN	AKN	ATA	ATA	-	-	-	-
C	ATA(4)	ATA	ATA	ATA	ATA	-	-	-	-

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
A	Tuesday	1.45	M 209
B	Tuesday	2.45	M 209
C	Monday	11.15	M 209

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	**Introduction to Networking** 1.1 Introduction to computer network, network application, network software and hardware components (Interconnection networking devices), Network topology, protocol hierarchies, design issues for the layers, connection oriented and connectionless services. 1.2 **Reference models**: Layer details of OSI, TCP/IP models. Communication between layer.	06	10%

2	**Physical Layer** 2.1 Introduction to Communication System, digital Communication, Electromagnetic Spectrum 2.2 **Guided Transmission Media**: Twisted pair, Coaxial, Fiber optics. Unguided media (Wireless Transmission): Radio Waves, Microwave, Bluetooth, Infrared, Circuit and Packet Switching	06	15%
3	**Data Link Layer** 3.1 DLL Design Issues (Services, Framing, Error Control, Flow Control), Error Detection and Correction(Hamming Code, CRC, Checksum) , Elementary Data Link protocols , Stop and Wait, Sliding Window(Go Back N, Selective Repeat), HDLC 3.2 **Medium Access Control sublayer** Channel Allocation problem, Multiple access Protocol(Aloha, Carrier Sense Multiple Access (CSMA/CD), Local Area Networks - Ethernet (802.3)	10	20%
4	**Network layer** 4.1 Network Layer design issues, Communication Primitives: Unicast, Multicast, Broadcast. IPv4 Addressing (classfull and classless), Subnetting, Supernetting design problems ,IPv4 Protocol, Network Address Translation (NAT) 4.2 **Routing algorithms** : Shortest Path (Dijkastra's), Link state routing, Distance Vector Routing 4.3 **Protocols** - ARP,RARP, ICMP, IGMP 4.4**Congestion control algorithms:** Open loop congestion control, Closed loop congestion control, QoS parameters, Token & Leaky bucket algorithms	14	25%
5	**Transport Layer** 5.1 The Transport Service: Transport service primitives, Berkeley Sockets, Connection management (Handshake), UDP, TCP, TCP state transition, TCP timers. 5.2 TCP Flow control (sliding Window), TCP Congestion Control: Slow Start.	10	20%
6	**Application Layer** 6.1 DNS: Name Space, Resource Record and Types of Name Server. HTTP, SMTP, Telnet, FTP, DHCP	06	10%
Total		**52**	**100%**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	3	ECCF	Digital modulation
2	4	AA	Shortest Path Algorithm

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	7	MC&C
2	6	CSS
3	8	DC

2.d Real Life Application Mapping – Mention Application from Very Common Day to Day Life

No.	Real Life Application Mapping with the Course
1	E-mail (SMTP protocol)
2	Searchable Data (World wide web)
3	E-Commerce (TCP/UDP)
4	News Groups(SNMP)
5	Internet Telephony (VoIP)
6	Video Conferencing(Skype)
7	Chat Groups(Whatsapp)
8	Instant Messengers (hike)
9	Network Traffic

3. Past Results – Division-Wise and Topic-Wise Result Based Analysis

Details	Target - Dec 2019	Dec 2018	Dec 2017	Dec 2016
Course Passing % – Average of 3 Divisions	100%	100%	96.7%	91.82%
Marks Obtained by Course Topper (mark/80)	75	67	62	66

	Division A		Division B		Division C	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Dec 2018	AKN	100	SNK	100	SNA	100
Dec 2017	AKN	97.3	SNK	92.9	DR	100
Dec 2016	SDE	88.31	AKN	97.33	DR	96.67

Topics which affect results negatively	Module Number	Recommendations to overcome these issues & improve result in future
Analytical questions that appear in Q.1.	4	Solving questions in classroom after the topic is done then giving pop quiz on it
Routing protocols	4	Student presentation

x

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Communication Networks	Andrew.S.Tanenbaum	Pearson Education	Fourth Edition	1,2,3,4,5,6
2	Data Communications and Networks	Fourozon	TMH,	Fourth Edition	1,2,3,4,5,6

4.b List of Text Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Computer Networking	James F. Kurose , Keith W. Ross	Pearson Education	SIXTH EDITION	1,2,3
2	TCP/IP protocol suite	Fourozon	TMH,	Fourth Edition	4,5,6
2	Computer Communications and Networking Technologies	M. A. Gallo and W. M. Hancock,	Cengage Learning (Indian Edition)	First Edition	1,2
3	Computer Networks : Principles, Technologies & Protocols for Network Design	Natalia Olifer & Victor Olifer	Wiley India	Second Edition	4,5
4	Computer Networks: A Systems Approach	Larry L.Peterson, Bruce S.Davie	Morgan Kaufmann	Second Edition	1,2,3,4,5

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Computer networks	Bhushan trivedi	Oxford	Fifth Edition	4,5,6
2	NETWORKING fundamentals CCNA Exploration Companion Guide	Mark A. Dye Rick McDonald Antoon W. Rufi	Cisco Press	First Edition	4,5
3	Local Area Networks	Behrouz A Forouzan	McGraw-Hill Publication	Fourth	1,2,3

4.d Web Links and Names of Magazines, Journals, E-journals – [VIT is member of IIT Bombay Library]

Refer online journals subscribed in VIT library. You can also access IIT Bombay online library for journals from IITB campus.

Sr. No.	Web-Links and Names of Journals and E-Journals Recommended to Students for this Course	Web-Links and Names of Magazines Recommended to Students for this Course	Module Nos.
1	NS2 tutorial- https://bayanbox.ir/view/3518759892213264101/NS-Simulator-for-Beginners-2012.pdf	Computer Networks by Elsevier https://www.elsevier.com/physical-sciences/computer-science/computer-networks	7
2	Cisco packet tracer: http://learn-networking.com/network-design/configure-a-router-with-packet-tracer	IEEE Network Magazine http://www.comsoc.org/netmag	4

4.e Module Best Available in - Tick the best resource [from *4.a* to *4.d* in this AAP] & give details

Module No.	Category (Please Tick Mark) - √						Available In VIT Library?		Details of the Resource (i.e. Name, Chapter & Page No., etc.)
	Book			Maga-zine	Journals				
	Text	Reference	E-Book		Regular	E-Journal	Y	N	
1	√	√					√		T1/1/10, T2/1/14,T2/1/26, T2/1/30 T2/1/32, T2/1/37
2	√	√					√		T2/2/90, T2/2/100, T2/2/106
3	√	√		√			√		T2/3/184, T2/3/211, T2/3/192,, T2/4/251, T2/4/271
4	√	√	√	√			√		T2/13/366, T3/22/666, T2/5/431, T2/5/384
5	√	√	√	√			√		T2/6/481, T2/6/524,532, T3/24/762, T3/24/777
6	√	√		√			√		T2/7/579,651, T2/7/588, T3/26/887,904, T3/26/907
7	√	√					√		T2/27/934,T2/27/938, T2/27/942 T2/27/947,T2/27/948

4.f Web Links for Online Notes/YouTube/VIT Digital Content/VIT Lecture Capture/NPTEL Videos

Students can view lectures by VIT professors, captured through LMS 'Lecture Capture' in VIT campus for previous years.

No.	Websites / Links	Module Nos.
1	http://www.notesengine.com/dept/cse/5sem/anna-university-5-sem-cn-notes.html	module 1,2,3,4,5
2	https://youtu.be/EWTJKcg7Pj8	module 1
3	https://youtu.be/25_dIc_4JG0	module 6
4	https://youtu.be/R3UmGs0Bht0	module 3
5	https://youtu.be/a84XIopJFXs	module 4

6	https://youtu.be/2ZUxoi7YNgs	module 6

4.g Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / TedX etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	Internet Emerging Technologies	Jong-Moon Chung, Professor, Director, Communications & Networking Laboratory (Yonsei University)	3 weeks	Y

4.h Recommended Value Added Courses (VAC)

Sr. No.	Name of the Value Added Course	Conducted by – Person / Institute / Industry	Course Duration	Certificate (Y / N)
1	Security and Software Defined Networking https://www.udacity.com/course/computer-networking--ud436	Online by Udacity	40 hrs	Y
2	Diploma in Computer Networking https://alison.com/course/diploma-in-computer-networking	Online by Alison	4 weeks	Y

4.i Study Material to be Distributed among Students

Tick if distributed among students					
GQ	Notes	Digital Content	PPT	EQ (updated till the Last Exam)	Other (Write Details)
☐	☐	☐	☐	☐	

5. Consolidated Course Lesson Plan

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	08/7/2019	/ /2019	

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	Cos	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No. / Page Nos./ Books/ Web Site
1	1,2	1	Introduction to computer network, network application		CO 1		T1/1/10
	3,4	1	network software and hardware components (Interconnection networking devices), Network topology, protocol hierarchies, design issues for the layers, connection oriented and connectionless services		C01		T2/1/14, T2/1/26, T2/1/30 T2/1/32
2	5,6	1	Reference models: Layer details of OSI, TCP/IP models. Communication between layer		C01		T2/1/37
	7,8	2	Introduction to Communication System, digital Communication, Electromagnetic Spectrum		CO 1		T2/13/366
3	9,10	2	Guided and Unguided Transmission media **Debate**		C01		T2/2/90
	11,12	4	Network Layer design issues, Communication Primitives: Unicast, Multicast, Broadcast. IPv4 Addressing (classfull and classless)		C01	Lec 1	T2/2/100
4	13,14	4	Subnetting, Supernetting design problems ,IPv4 Protocol, Network Address Translation (NAT)		CO 3	Lec 1	T2/3/184

	15,16	4	Routing algorithms : Shortest Path (Dijkastra's), Link state routing, Distance Vector Routing		C04	Lec 7,8,9	T2/3/192
5	17,18	3	Protocols - ARP,RARP, ICMP, IGMP **Visit to Server Room**		C04	Lec 7,8,9	T2/3/192
	19,20	3	DLL Design Issues (Services, Framing, Error Control, Flow Control Error Detection and Correction(Hamming Code, CRC, Checksum) , Elementary Data Link protocols		CO 2	Lec 20	T2/3/192
6	21,22		IA -1				
	23,24		IA -1				
7	25,26	3	Carrier Sense Multiple Access (CSMA/CD), Local Area Networks - Ethernet (802.3)		C02	Lec 26,27	T2/3/192
	27,28	3	Stop and Wait, Sliding Window(Go Back N, Selective Repeat), HDLC		CO 2	Lec 27,28	T2/5/431
8	29,30	3	Medium Access Control sublayer Channel Allocation problem, Multiple access Protocol(Aloha) **OBT And Quiz**		CO 2	Lec 23	E1/22/666
	31,32	4	Congestion control algorithms: Open loop congestion control, Closed loop congestion control, QoS parameters, Token & Leaky bucket algorithms		CO 3		T2/5/431
9	33,34	5	The Transport Service: Transport service primitives, Berkeley Sockets,		CO 5	Lec1 4	T2/5/431
	35,36	5	Connection management (Handshake), UDP, TCP		CO 5	Lec 15	T2/5/384
10	37,38	5	TCP timers , TCP state transition		CO 5	Lec 16	T2/6/481
	39,40	5	TCP Flow control (sliding Window)		CO 5	Lec 17	T2/6/481
11	41,42	5	TCP Congestion Control: Slow Start **Video demonstration**		CO 5	Lec 17	T2/6/481
	43,44	6	DNS: Name Space, Resource Record and Types of Name Server. **Guest lecture**		CO 6	Lec 18	T2/6/481
12	45,46	6	HTTP, SMTP		CO 6	Lec 19	E1/24/777

	47,48	6	Telnet, FTP, DHCP		CO 6	Lec 18	T2/7/579,651
13	49,50		REVISION				T2/7/579,651
	51,52		REVISION				E1/26/887,9042/7/588
14	53,54		REVISION				
	55,56		REVISION				

6. Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% Attendance) & Marks	Assign-ments	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Tutorial	Other (1) specify	Other (2) specify	Total
10	5	5	5	5	-			25

7. Assignments / Tutorials Details (must attach print out of all questions together with AAP)

Assignment No.	Title of the Assignments / Tutorials	CO Map	Assignments given to Students on	Date of Submission
1	Assignment 1	CO1, CO2	8/7/2019	31/07/2019
2	Assignment 2	CO4,CO3	8/7/2019	22/08/2019
3	Assignment 3	CO5	8/7/2019	11/09/2019
4	Assignment 4	CO6	8/7/2019	3/10/2019

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	UQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	4	√			1,2	T1, T2	R1, R2		√	
2	7	√			3,4	T1, T2	R2			√
3	10	√			4,5	T1, T2	R3, R5		√	√
4	13			√	1,2,4,5,6	T1	R3, R4		√	

* Tick (√) the Type of the Assignment: Regular (R); Unannounced Quiz (UQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for Text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8. Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	IA Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test		1,2,3,4		Q1 – MCQ - 10 Marks Q2 – 1 numerical 5 Marks Q3 – 1 numerical 5 Marks 20 marks each for IA 1 & 2	No IA Re-test IA is a Head of passing *
2nd IA Test		4,5,6,7			
Class tests	Week 9	3,4,5	CO1, CO2		

*** IA failures will have to appear for re-test in next semester**

9.a Practical Activities – Regular Experiments

Practical No.	Module No.	Title of the **Regular Experiment**	Concepts to be highlighted	CO Map	Audit / Quality Rate (0 to 4)
1	1	Study of networking, historical perspective, types of network, networking devices, topologies in packet tracer and current trends in networking servers	Network designing	CO1	4
2	1	Find how the LAN Environment of VIT is setup.	Network designing	CO1	
3	6	Use basic networking commands in Linux (ping, tracert, nslookup, netstat, ARP, RARP, ip, ifconfig, dig, route)	Basic Commands	CO4	4
4	1,2,4	Case Study: Visit to Server Room for understanding Network Infrastructure	IT Infrastructure	CO1,CO4,CO6	
5	4,6	Use Wireshark to understand the operation of TCP/IP layers : ● Ethernet Layer : Frame header, Frame size etc. ● Data Link Layer : MAC address, ARP (IP and MAC address binding) ● Network Layer : IP Packet (header, fragmentation), ICMP (Query and Echo) ● Transport Layer: TCP Ports, TCP	Wireshark	CO6	4

		handshake segments etc. Application Layer: DHCP, FTP, HTTP header formats			
6	4	Write a program to implement find out class of a given IP address, subnet mask & first & last IP address of that block	IP addressing	CO3	4
7	3	Implement CRC Error detection mechanism	Error Detection	CO2	
8	3	Implement Stop and wait protocol in DLL	Flow control	CO2	4
9	5	Socket programming for TCP and UDP	Socket Addressing	CO5	4
10	4	Implement Djikstra's algorithm for demonstrating Distance Vector Routing	DVR	CO4	4
11	6	Use CISCO Packet tracer for packet analysis.	Packet Analysis	CO6	4
12	4	Simulation of Distance vector routing using NS2	RIP protocol	CO4	4

9.b Practical Activities – Newly Added Experiments

Practical No.	Module No.	Title of the **Newly Added Experiments**	Concepts to be highlighted	CO Map	Audit / Quality Rate (0 to 4)
11	6	Use CISCO Packet tracer for packet analysis.	Packet Analysis	CO6	4
12	4	Simulation of Distance vector routing using NS2	RIP protocol	CO4	4

9.c Practical Activities – PBL Experiments

Practical No.	Module No.	Title of the **PBL Experiments**	Concepts to be highlighted	CO Map	Audit / Quality (0 to 4)
5	4,6	Use Wireshark to understand the operation of TCP/IP layers : ● Ethernet Layer : Frame header, Frame size etc. ● Data Link Layer : MAC address, ARP (IP and MAC address binding) ● Network Layer : IP Packet (header, fragmentation), ICMP (Query and Echo) ● Transport Layer: TCP Ports, TCP handshake segments etc. Application Layer: DHCP, FTP, HTTP header formats	Wireshark	CO6	4

10. Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Details
1	Interaction with Outside World	Guest Lecture / Workshops	Mr. Prathamesh Dalvi (Reliance Communication) on "IOT" in week 11
2		Industrial Visit	Week 5
3	Test and Assessments	Class Tests – (other than IA)	Week 8
4		Mini Projects	-
5		Pop Quiz	Week 8
6		Mobile App Based Quiz	
7	Collaborative and Group Activity	Poster Presentation	-
8		Minute Papers	-
9		Students Seminar	Week 11
10		Students Debates	Week 3
11		Panel Discussion / Mock GD	-
12		Mock Interview	--
13	Co-curricular Courses	MOOC-NPTEL/Coursera Videos	Internet Emerging Technologies, Week 10
14		Value Added Courses	-
15		Lecture Capture Usage	Yes

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Faculty 1 Name (Sign.)

Faculty 2 Name (Sign.)

Faculty 3 Name (Sign.)

External Industry Mentor (Sign.)

External Academic Mentor (Sign.)

VIT Cluster Mentor Name (Sign.)

Head Computer Engineering Dept. (Sign.)