DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	Data Communications and Networks		
Course Code	CSPC27	No. of Credits	3
Course Code of Pre-requisite subject(s)	NIL		
Session	Jan. 2018	Section (if, applicable)	A
Name of Faculty	Dr.B.Nithya	Department	CSE
Email	nithya@nitt.edu	Telephone No.	0431-2503214
Name of Course Coordinator(s) (if, applicable)	Not applicable		
E-mail	-	Telephone No.	-
Course Type	Core course		

Syllabus (approved in BoS)

CSPC 27: Data Communications and Networks

UNIT - I

Introduction to computer networks: Network –Component and Categories –Topologies –Transmission Media –Reference Models: ISO/OSI Model and TCP/IP Model. *

UNIT -II

Physical Layer: Digital and analog Signals, Periodic Analog Signals, Transmission Impairments, Digital data transmission techniques, Analog data transmission techniques, Multiplexing and Spread Spectrum. *

UNIT-III

Data Link Layer: Error –Detection and Correction –Parity –LRC-CRC – Hamming Code –Flow Control and Error Control –Stop and wait –ARQ –Sliding window –HDLC – Multiple Access Protocols – IEEE 802.3 Ethernet. *

UNIT -IV

Network Layer: Packet Switching and Datagram approach –IP Addressing methods – Subnetting – Routing –Distance Vector Routing –Link State Routing–Broadcast and Multicast Routing. *

UNIT -V

Transport Layer: Transport Services –UDP -TCP -Congestion Control –Quality of Services(QOS) Application Layer: Domain Name Space (DNS) –Electronic Mail - WWW –Cryptography Techniques. *

Text Books

1.Andrew S. Tanenbaum and David J. Wetherall, "Computer Networks", 5th edition, Prentice Hall, 2011

2. Behrouz A. Foruzan, "Data Communication and Networking", 5th edition, Science

Engineering& Math Publications, 2013

Reference Book

1.W. Stallings, "Data and Computer Communication", 10th Edition, Pearson Education, 2014.

COURSE OBJECTIVES

- To provide insight about fundamental concepts and reference models (OSI and TCP/IP) and its functionalists
- To gain comprehensive knowledge about the principles, protocols, and significance of Layers in OSI and TCP/IP.
- To know the implementation of various protocols and cryptography techniques.

COURSE OUTCOMES (CO)

Course Outcome (CO)	Aligned Programme Outcome (PO)							
	PO-1	PO-2	PO- 3	PO-4	PO-5	PO-6	PO-7	PO-8
Ability to gain insight about basic network theory and layered communication architectures	S	M	S	M	B	S	M	M
Ability to provide solutions to various problems in network theory	S	S	S	M	S	S	B	S
Ability to conceptualize and design a network stack	S	M	B	M	M	S	B	M

COURSE PLAN – PART II

COURSE OVERVIEW

This course provides an overview of basic networking concepts such as Reference models, Principles, protocols and standards. It also emphasizes significance of OSI layers and cryptography techniques.

COURSE TEACHING AND LEARNING ACTIVITIES

Contact Hour	Title	Type		Mode of delivery			
		L	T	C&T	PPT	VL/VC	DEMO
UNIT I							
1.	Introduction	√		√			
2.	Components, Line configuration, Transmission modes	√		√			
3.	Network Topologies, Categories of Networks	√		√			

4.	OSI Layers: Design issues and design goals	√		√			
5.	Functions of OSI layer, reasons for layered architecture	√		√			
6.	TCP/IP Reference model	√		√			
7.	Transmission media: Guided Media	√		√			
8.	Unguided Media	√		√			
UNIT V							
9.	Application Layer & its function, E-mail system	√		√			
10.	Cryptography techniques, Classification, Symmetric techniques	√		√			
11.	S-DES, RSA	√		√	√		
12.	Transport layer: Services , UDP	√		√			
13.	UDP checksum, TCP, TCP header format	√		√			
14.	TCP connection establishment	√		√	√		
15.	TCP Data Transfer & TCP connection Termination	√		√	√		
16.	Flow and Error control in transport layer, Windows in TCP	√		√			
UNIT IV							
17.	Network Layer: Services and design goals	√		√			
18.	Packet Switching and Datagram approach	√		√			
19.	IP addressing methods	√		√			
20.	Subnetting	√		√			
21.	Solving problems in IP addressing & subnetting		√	√			
22.	Routing – Distance Vector Routing	√		√			
23.	Link State Routing	√		√			
24.	Broadcast and Mulitcast Routing.	√		√			
UNIT III							
25.	Error, types, VRC and LRC	√		√			
26.	CRC ,polynomial representation, Error analysis	√		√			
27.	Burst Error, Check sum, Hamming code	√		√			

28.	Flow control: Stop and Wait	√		√			
29.	Go Back N, Selective Repeat ARQ	√		√			
30.	Solving problems in flow control techniques		√	√			
31.	Sliding window concepts	√		√	√		
32.	Multiple Access Protocols	√		√	√		
33.	Ethernet, frame format, addressing encoding	√					
34.	Types of Ethernet	√					
UNIT II							
35.	Digital and analog Signals,	√		√			
36.	Periodic Analog Signals, Transmission Impairments,	√		√			
37.	Digital data transmission techniques,	√		√			
38.	Analog data transmission techniques,	√		√			
39.	Multiplexing	√		√			
40.	Spread Spectrum	√		√			

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test	After completion of 2 units	1hr	15
2	Quiz	After completion of next two units	1 hr	15
3	Assignment-1	-	-	10
4	Assignment-2	-	-	10
CPA	Retest	After cyle test & Quiz	1hr	15
5	Final Assessment *	As per Schedule	3hrs	50

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

- Feedbacks are collected before final examination through MIS or any other standard format followed by the institute
- Students, through their Class Representatives, may give their feedback at any time to the course faculty which will be duly addressed.
- The students may also give their feedback during Class Committee Meeting.

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc)

E-mail/Phone

ATTENDANCE

- Minimum 75% is mandatory to write the end semester examination. Students having attendance 65% to 74% are eligible for the end semester exam only after attending the extra classes and submitting assignments. Students have to redo the course, if they have less than 65% of attendance.
- Medical Certificate / On Duty Certificate should be submitted immediately after rejoining.

COMPENSATION ASSESSMENT

- One compensation assessment will be given after completion of Cycle Test 1 and 2 for the students those who are absent for any assessments due to genuine reason.
- The prior permission and required document must be submitted for the absence.

ACADEMIC HONESTY & PLAGIARISM

- Avoid usage of electronic devices during the class or test or exam.
- The students are expected to come out with their original solution for the problems given in the assignment. If found to copy from internet/other students, marks will be reduced.

ADDITIONAL INFORMATION

The students can get their doubts clarified at any time with their faculty member with prior appointment.

FOR APPROVAL

Course Faculty _____ **CC-Chairperson** _____ **HOD** _____

(B. Nithya)