Academic Course Description

BHARATH UNIVERSITY

Faculty of Engineering and Technology

Department of Electronics and Communication Engineering

BET008 INTEGRATED SERVICES DIGITAL NETWORK

Eight Semester, 2016-17 (Odd Semester)

Course (catalog) description

The course helps the students to Study basic concepts of ISDN standards and services. This course develops the knowledge in ISDN protocol Architecture and Signaling. It imparts knowledge on concepts of Broad band ISDN. It explains Network performance Modeling and Estimation.

Compulsory/Elective course: Elective for ECE students

Credit & contact hours   : 3 & 45

Course Coordinator   : Ms.G.Kanagavalli, Assistant Professor, Department of ECE

Instructor(s)

Name of the Instructor	Class handling	Office location	Office Phone	Email(Domain:@bharathuniv.ac.in)	Consultation
Ms.G.Kanagavalli	Final Year	SA006		Kanagavalli.ece@bharathuniv.ac.in	12.45-1.15 PM

Relationship to other courses

Pre-requisites   : Computer Communication and Networks

Assumed knowledge   : The students will have a physics and mathematics background obtained at a high school (or equivalent)   level. In particular, working knowledge of basic mathematics including differentiation, integration and probability theories are assumed.

Following courses   : Nil

UNIT I   ISDN – STANDARDS AND SERVICES: 9
Review of switching technologies and OSI protocol architecture, ISDN channels, access interfaces, functional devices and standards, ISDN bearer services and teleservice attribute,Broadband services.

UNIT II   ISDN PROTOCOL ARCHITECTURE AND SIGNALI NG   9
Physical layer protocol, D-channel datalink layer and layer 3 protocols, Network signaling systems, SS7 protocol overview and services, ISDN products, Switches, Multiplexers, Terminal adapters, ISDN chip sets.

UNIT III   BROAD BAND ISDN   9

Frame Relay – concepts, protocols, applications and products, asynchronous transfer mode –concepts, protocols, application and products, switched multi megabit data service, Internet protocol over ISDN frame relay and ATM.

UNIT IV   NETWORK TRAFFIC MANAGEMENT   9
ATM traffic and congestion control, Traffic management framework, control mechanism and attributes, ABR traffic management

UNIT V   NETWORK PERFORMANCE MODELING AND ESTIMATION   9
Queueing analysis, single server and multi server queues, Networks of Queues, Estimating model parameters, Self-similar traffic – performance implication, modeling and estimation

                                                                                         Total : 45 Periods

TextBook:
   T1. Gary C. Kesslar and Peter Southwick, "ISDN – concepts, facilities and services", McGraw Hill, 3rd Edition, 1997.
   T2. William Stallings, "High Speed Networks-TCP/IP and ATM Design Principles", Prentice Hall Inc., 1998.

References:
   R1. William Stallings , "High-Speed Networks and Internets: Performance and quality of Service"
      (2nd   Edition) , 2002

   R2. Balaji Kumar, "Broad Band Communications" McGraw-Hill, 1995

Computer usage: Nil

Professional component
   General   -   0%
   Basic Sciences   -   0%
   Engineering sciences & Technical arts   -   0%
   Professional subject   -   100%

Broad area : Computer Networks, Communication Engineering.

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	August 1st week	Session 1 to 14	2 Periods
2	Cycle Test-2	September 2nd week	Session 15 to 28	2 Periods
3	Model Test	October 2nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

To develop problem solving skills and understanding of circuit theory through the application of techniques and principles of electrical circuit analysis to common circuit problems. This course emphasizes:	Correlates to program outcome		
	H	M	L
1. To know the basics of ISDN	a	d,f,j	
2. Protocols involved in ISDN	c	a,b,l	
3. To learn about Broad Band ISDN	c,d,e,i,l	a,g	
4. To understand about network Management	-	a,k	
5. To Empower knowledge in Network Traffic Management	-	b,e,i	
6. Estimate the Network Performance	c,f	b,j,l	

H: high correlation, M: medium correlation

Draft Lecture Schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I	**ISDN – STANDARDS AND SERVICES**		
1.	Introduction, Communication Basics, Digital Telephony	No	[T1] Chapter -1,2,3
2.	Review of switching technologies	No	
3.	OSI protocol architecture	No	
4.	ISDN channels	No	
5.	Access interfaces	No	
6.	functional devices and standards	No	
7.	ISDN bearer services	No	
8.	Tele service attribute	No	
9.	Broadband services	No	
UNIT II	**ISDN PROTOCOL ARCHITECTURE AND SIGNALI NG**		
10.	Physical layer protocol	No	[T1] Chapter -5,6,7,13,17,21
11.	D-channel datalink layer 3 protocols	No	
12.	Basic Packet-and Frame-Mode Calls	No	
13.	Controlling and Invoking Supplementary Services	No	
14.	Network signaling systems	No	
15.	SS7 protocol overview and services,	No	
16.	ISDN products	No	
17.	Switches, Multiplexers	No	
18.	Terminal adapters, ISDN chip sets	No	
UNIT III	**BROAD BAND ISDN**		
19.	Frame Relay basics	No	[T1] Chapter -14, 15, 17,
20.	Concepts, Protocols	No	
21.	Applications and Products	No	
22.	Asynchronous transfer mode	No	
23.	Concepts, protocols	No	
24.	Application and products	No	
25.	switched multi megabit data service	No	

26.	Internet protocol over ISDN frame relay	No	
27.	Internet protocol over ATM	No	
UNIT IV	**NETWORK TRAFFIC MANAGEMENT**		
28.	ATM Standards	No	[T1] Chapter -18,19
29.	ATM consepts	No	
30.	ATM protocol architecture	No	
31.	ATM Applications	No	
32.	ATM Traffic Management	No	
33.	ATM Congestion Control	No	
34.	control mechanism	No	
35.	Attributes	No	
36.	ABR traffic management	No	
UNIT V	**NETWORK PERFORMANCE MODELING AND ESTIMATION**		
37.	Queueing analysis	No	[T2] Chapter -3
38.	single server queues	No	
39.	multi server queues	No	
40.	Networks of Queues	No	
41.	Estimating model parameters	No	
42.	Self-similar traffic	No	
43.	performance implication	No	
44.	modeling	No	
45.	Estimation	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures

- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.

- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.

- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment /Seminar/Online test/Quiz	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by: Ms.G.Kanagavalli, Assistant Professor , Department of ECE   **Dated :**

Addendum

ABET Outcomes expected of graduates of B.Tech / ECE / program by the time that they graduate:

a. An ability to apply knowledge of mathematics, science, and engineering

b. An ability to design and conduct experiments, as well as to analyze and interpret data

c. An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

d. An ability to function on multidisciplinary teams

e. An ability to identify, formulate, and solve engineering problems

f. An understanding of professional and ethical responsibility

g. An ability to communicate effectively

h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

i. A recognition of the need for, and an ability to engage in life-long learning

j. A knowledge of contemporary issues

k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives

PEO1: PREPARATION
Electronics Engineering graduates are provided with a strong foundation to passionately apply the fundamental principles of mathematics, science, and engineering knowledge to solve technical problems and also to combine fundamental knowledge of engineering principles with modern techniques to solve realistic, unstructured problems that arise in the field of Engineering and non-engineering efficiently and cost effectively.

PEO2: CORE COMPETENCE
Electronics engineering graduates have proficiency to enhance the skills and experience to apply their engineering knowledge, critical thinking and problem solving abilities in professional engineering practice for a wide variety of technical applications, including the design and usage of modern tools for improvement in the field of Electronics and Communication Engineering.

PEO3: PROFESSIONALISM
Electronics Engineering Graduates will be expected to pursue life-long learning by successfully participating in post graduate or any other professional program for continuous improvement which is a requisite for a successful engineer to become a leader in the work force or educational sector.

PEO4: SKILL
Electronics Engineering Graduates will become skilled in soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, interpersonal relationship, group discussion and leadership ability to become a better professional.

PEO5: ETHICS
Electronics Engineering Graduates are morally boosted to make decisions that are ethical, safe and environmentally-responsible and also to innovate continuously for societal improvement.

Course Teacher	Signature
Ms.G.Kanagavalli	

Course Coordinator   **HOD/ECE**