Academic Course Description

BHARATH UNIVERSITY

Faculty of Engineering and Technology

Department of Electronics and Communication Engineering

Eighth Semester, 2016-17 (Even Semester)

Course (catalog) description

- To learn about the various switching systems
- To learn in detail about time division switching.
- To know about traffic management.
- To understand about various signaling in telecommunication systems
- To analyze various telecommunication networks
- To estimate the performance of telecommunication networks.

Compulsory/Elective course: Elective for ECE students

Credit & contact hours   : 3 & 45

Course Coordinator   : Ms S.Beulah Hemalatha, Associate Professor

Instructors   :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Ms S.Beulah Hemalatha	Final year	SA block		beulah.ecevlsi@gmail.com	12.45-1.30 PM

Relationship to other courses:

Pre –requisites   **:** Computer Communication 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   : Satellite Communication, Mobile Communication

Syllabus Contents

UNIT -I SWITCHING SYSTEMS   9

Introduction-Message switching-Circuit switching-Manual switching-Functions of switching system- Strowger step by step system-Register translator-Senders-Distribution frames-Cross bar systems-General trunking-Electronic switching-Reed electronic systems-Digital switching systems.

UNIT- II TIME DIVISION SWITCHING   9

Introduction-Space and time switching-Time division switching networks-grades of services-Time division switching networks-non blocking networks-synchronization.

UNIT -III TELECOMMUNICATION TRAFFIC   9

Introduction-Unit of traffic-Congestion-Traffic measurement-A mathematical model-Local call systems-Queuing systems.

UNIT -IV TELECOMMUNICATION SIGNALLING   9

Introduction-Customer line signaling- Audio frequency junction and trunk circuits-FDM carrier systems-PCM signaling- Inter register signaling- Common channel signaling principles-CCITT signaling, CCITT signaling, Digital customer line signaling.

UNIT-V TELECOMMUNICATION NETWORKS   9

Introduction-Analog networks-Integrated digital networks-Integrated service digital networks-Cellular radio networks-Intelligent networks-Private networks-numbering-charging-Routing-Network management.

TOTAL NO OF PERIODS: 45

TEXTBOOK:

1. J.E FLOOD, "telecommunication switching, traffic and networks" Pearson education.

REFERENCE BOOKS:

1. T.V.SWAMINATHAN, telecommunication switching system &networks,PHI.
2. **http://www.newagepublishers.com/samplechapter/000969.pdf**

Computer usage: Yes

Professional component

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

Broad area: switching systems | Electronics | Communication systems | Switching Networks |
Test Schedule

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

Mapping of Instructional Objectives with Program Outcome

Understanding about the various switching systems, time division switching. Understand about traffic management and also about various signaling in telecommunication systems and to estimate the performance of telecommunication networks.	Correlates to program outcome		
	h	m	l
To learn about the various switching systems	b,c,	g	-
To learn in detail about time division switching.	b,c	g	-
To estimate the performance of telecommunication networks.	c	b,d	h
To understand about various signaling in tele communication systems	h,c	k,i	-
To analyze various telecommunication networks	e	c,d,g	j,k
To know about traffic management.	h	j	

H: high correlation, M: medium correlation, L: low correlation

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT -I SWITCHING SYSTEMS			
1.	Introduction - Reed electronic systems-Digital switching systems	No	[T1] Chapter -1, [T1]Chapter-3
2.	Message switching	Yes	
3.	Circuit switching	No	
4.	Manual switching	Yes	
5.	Functions of switching system	Yes	
6.	Strowger step by step system	Yes	
7.	Register translator-Senders-Distribution frames	Yes	
8.	Cross bar systems, General trunking	Yes	
9.	Electronic switching	Yes	
UNIT- II TIME DIVISION SWITCHING			
10.	Introduction Space and time switching	No	[T1] Chapter -6
11.	Time division switching networks	Yes	
12.	Basic networks	No	
13.	Bidirectional paths	No	

15.	PBX switches	No	
16.	non blocking networks	No	
17.	Synchronization.	No	
18.	Time switching	Yes	

UNIT -III TELECOMMUNICATION TRAFFIC

19.	Introduction	Yes	
20.	Unit of traffic	Yes	
21.	Congestion	Yes	
22.	Traffic measurement	Yes	
23.	A mathematical model	Yes	[T1]Chapter-4 87-116
24.	Local call systems	Yes	
25.	Queuing systems	Yes	
26.	Probability of delay	Yes	
27.	Simulation	No	

UNIT -IV TELECOMMUNICATION SIGNALLING

28.	Introduction	No	
29.	Customer line signaling	No	
30.	Audio frequency junction and trunk circuits	No	[T1]Chapter-8 204-229
31.	FDM carrier systems	No	
32.	PCM signaling	No	

33.	Inter register signaling	No	
34.	Common channel signaling	No	
35.	principles-CCITT signaling	No	
36.	Digital customer line signaling	No	
UNIT-V TELECOMMUNICATION NETWORKS			
37.	Introduction	No	
38.	Analog networks	No	
39.	Integrated digital networks	No	
40.	Integrated service digital networks	No	
41.	Cellular radio networks	No	[T1] Chapter 10 Pp254-291
42.	Intelligent networks	No	
43.	Private networks	No	
44.	Numbering	No	
45.	Charging-Routing-Network management.	Yes	

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 brain stroming 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 S.Beulah Hemalatha , Assoc. 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 improvemen

Course Teacher	Signature
Ms S.Beulah Hemalatha	

Course Coordinator   **HOD/ECE**