Marks	Grade Point	Letter Grade	*Marks*	Grade Point	Letter Grade
80>	4.00	A+	55-59	2.75	B
75-79	3.75	A	50-54	2.50	C+
70-74	3.50	A-	45-49	2.25	C
65-69	3.25	B+	40-44	2.00	D
60-64	3.00	B	0-39	0.00	F

Daffodil Polytechnic Institute, Institute Code: 50238

Lesson Plan – Academic session: February - June 2023

Mark Distribution (for 200 Marks)			
Theory Marks		Practical Marks	
Midterm	30	PC	25
Class test	20	PF	25
Quiz test	10	-	-
Final	90	-	-
Total	150	Total	50

Subject Teacher : Shuva Sarker (Jr. Instructor)
Subject Name : Mobile Communication & Network
Subject Code : 68451
Technology : Telecommunication
Semester : 7th
Reference Book : 1. Principles of Mobile Communication - Gordon L Stuber

INTENTION

Class Time Distribution (90 Minutes)	
Follow up absent students	5
Previous class review	10
Present class topic discussion	60
Present class topic review	10
Next class topic	5
Total 90	

AIMS

• To be able to understand mobile Communication and Network. • To be able to understand digital cellular mobile systems. • To be able to understand cordless Communication system. • To be able to understand Mobile data Communication system. • To be able to understand telecommunication management network (TMN) and signaling system • To be able to understand TDMA cellular mobile communication • To be able to understand CDMA cellular mobile communication • To be able to understand global mobile satellite system. • To be able to understand numbers and identities for mobile communication. • To be able to understand Traffic Engineering and tracking system

SHORT DESCRIPTION

Concept of mobile communication and network; Cellular concept and its initial implementations; Digital cellular mobile systems; Cordless communications systems (CT2, DECT, PACS and PHS); Mobile data communication systems; Third generation mobile communication system; telecommunication management network (TMN) and signaling system; concept of TDMA cellular mobile communication; concept of CDMA cellular mobile communication; Global mobile satellite systems; Numbers and identities fomobile communication services; performance benchmarks for mobile; Traffic engineering and tracking system.

Daffodil Polytechnic Institute

Lec.	Chapter	Class Supporting Equipment's	Learning Area	Learning Outcome
01	1. Understand the concept of mobile communication and network.	Projector, Internet, Computer **You tube Link:** Bandwidth And Frequency Spectrum | Basic Concepts | Communication Systems - YouTube	**1.1** Define the concept of mobile communication and mobility **1.2** Define the terms of terminal mobility, personal mobility, service portability and MNP **1.3** Describe the GSM mobile communication system and mention frequency bands	* After the Class, Students will be able: - to learn about the basic concepts of Mobility, personal mobility, MNP and Frequency bands.
02	1. Understand the concept of mobile communication and network	Projector, Internet, Computer **You tube Link:** 2G, 3G and 4G Network Architecture - PLMN (Public Land Mobile Network) - YouTube	**1.4** Describe the basic concept of past, present and future mobile communication. **1.5** Describe the idea of related network aspects of mobile communication. **1.6** Describe the general objectives & architecture of GSM public land mobile networks (PLMN). **1.7** Describe the subsystems and interfaces of GSM system.	* After the Class, Students will be able: - to learn about the properties of determinants.
03	02. Understand the cellular concept, its initial implementation and the features of radio link in GSM system,	Projector, Internet, Computer. **You tube Link:** call setup in gsm - YouTube Mobile Communication 3 - What is a Handoff Procedure ? - YouTube	**2.1** Describe the frequency reuse concept in cellular mobile systems**. 2.2** Describe the multiple access technologies for cellular mobile system.**2.3** Describe the procedure of location updating and call setup. **2.4** Describe the procedure of hand-off.	* After the Class, Students will be able to: - learn about Cellular mobail system, GSM Location update , call set up and hand-off process .
04	02. Understand the cellular concept, its initial implementation and the features of radio link in GSM system,	Projector, Internet, Computer **You tube Link:** Mobile Communication - Frequency Reuse - Cell Splitting - Handoff Procedure - YouTube	2.5 Describe the initial implementations off the cellular concept (Analog cellular system). 2.6 Mention the base station identity code (BSIC) signal and quality level in GSM. 2.7 Define the terms Cell splitting, Sectoring and Repeater for range extension. 2.8 Describe the advantages and disadvantages of GSM .	* After the Class, Students will be able to: - understand the Signal quality level in GSM , cell splitting, sectoring and advantage or disadvantage of GSM system .

05	**Quiz Test-01**	**Theory Base**	**Chapter – 01,02**	**Be confident on examination.**

Daffodil Polytechnic Institute

Lec.	Chapter	Class Supporting Equipment's	Learning Area	Learning Outcome
06	3. Understand the concept of digital cellular mobile system	Projector, Internet, Computer You tube Link: UMTS - YouTube	3.1 Mention the advantages of digital cellular systems 3.2 Describe GPRS, EDGE, UMTS, HSPA and HSPA+. 3.3 Mention the initial global system for mobile communication (GSM) standards. 3.4 List the services supported by GSM.	After the Class, Students will be able to: - solve the EDGS, UMTS,HSPA and digital cellular systems.
07	**Class Test-01**	**Theory Base**	**Chapter - 01, 02**	**Be confident on examination.**
08	3. Understand the concept of digital cellular mobile system	Projector, Internet, Computer You tube Link: L14: GSM Architecture, Features, Interfaces | HLR, VLR, AuC, EIC Registers | Mobile Computing - YouTube	3.5 Describe the reference architecture and signaling interfaces of GSM, 3G and 4G. 3.6 Mention the deferent characteristics for GSM radio aspects and security aspects of GSM. 3.7 Describe the typical call flow sequences in GSM. 3.8 Describe the evolutionary directions for GSM cellular systems (1G, 2G, 3G, 4G, 5G)	* After the Class, Students will be able to: - learn about the GSM interface , radio aspects , call flow sequences in GSM, Describe the evolutionary directions for GSM cellular systems (1G, 2G, 3G, 4G, 5G)
09	4. Understand the concept of Cordless communications systems.	Projector, Internet, Computer You tube Link: DECT in Mobile Communication: What is Cordless Telephone and how it works? - YouTube	4.1 List the radio specifications for cordless telecommunication system (CT2, DECT, PACS & PHS) 4.2 Describe the main application environment and radio aspects for cordless telephone system. 4.3 Describe the signaling layers of cordless telephone system. 4.4 Describe the functional model structure for digital enhanced cordless telecommunication (DECT).	* After the Class, Students will be able to: - functional model structure for digital enhanced cordless telecommunication (DECT), radio specifications for cordless telecommunication system (CT2, DECT, PACS & PHS).

10	**Quiz Contest 2**	**Theory Base**	**Chapter – 03,04**	**Be confident on examination.**
11	4. Understand the concept of Cordless communications systems.	Projector, Internet, Computer You tube Link: Wireless Technology | Tutorial #23 | GSM Frame Structure - YouTube	4.5 Describe the layered architecture and network aspects of DECT. 4.6 Describe the logical channels and Frame structure of GSM. 4.7 Describe the inter networking architecture of DECT/GSM. 4.8 Describe the radio aspects, general features, network and protocol aspects for PACS & PHS.	* After the Class, Students will be able : - to learn about the architecture and network aspects of DECT, the logical channels and Frame structure of GSM, the radio aspects, general features, network and protocol aspects for PACS & PHS.

Lec.	Chapter	Class Supporting Equipment's	Learning Area	Learning Outcome
12	5. Understand the concept of mobile data communications and security in GSM.	Projector, Internet, Computer You tube Link: GPRS Architecture ll General Packet Radio Service ll SGSN,GGSN,GPRS Network Explained in Hindi - YouTube Mobile Networks / PS-Core Introduction / Packet Switching (Episode 14) - YouTube	5.1 List the applications and ranges of mobile data communication system. 5.2 Describe the features of specialized packet data and mobile radio networks. 5.3 Describe the techniques for circuit switched data services on cellular (analog& digital) network. 5.4 Describe the technique for high speed circuit switched data services on cellular networks.	* After the Class, Students will be able to: - ranges of mobile data communication system, specialized packet data and mobile radio networks, circuit switched data services on cellular (analog& digital) network, technique for high speed circuit switched data services on cellular networks.
	MID TERM			

Daffodil Polytechnic Institute

13	5. Understand the concept of mobile data communications and security in GSM.	Projector, Internet, Computer You tube Link: How do SIM Cards work? - SIMtrace - YouTube	5.5 Describe the technique for packet data service in analog cellular networks. 5.6 Describe the mechanism used for privacy and security in GSM systems. 5.7 Describe the authentication requirements in GSM network. 5.8 Mention the types of SIM card used in GSM.	* After the Class, Students will be able to: types of SIM card used in GSM, Describe the authentication requirements in GSM network.
14	6. Understand the concept of management of GSM network and signaling system.	Projector, Internet, Computer You tube : OSI Model Explained | OSI Animation | Open System Interconnection Model | OSI 7 layers | TechTerms - YouTube	6.1 Define traditional approaches to network management (NM). 6.2 Describe the layers of telecommunication management network (TMN). 6.3 Describe the concept of IMEI, IMSI, SIM, MSISDN and TMSI. 6.4 Describe OSI systems management.	* After the Class, Students will be able to: OSI systems management,the concept of IMEI, IMSI, SIM, MSISDN and TMSI, approaches to network management (NM
15	06. Understand the concept of management of GSM network and signaling system.	Projector, Internet, Computer You tube Link: what is SS7 ? - Signalling System Number-7 Architecture - YouTube	6.5 Describe the architecture and interfaces of network management. 6.6 Describe the functionality of NMS, NMC, OMC and NOC. 6.7 Describe the different types of signaling system. 6.8 Describe the signaling format of SS7.	* After the Class, Students will be able to:the signaling format of SS7, functionality of NMS, NMC, OMC and NOC. architecture and interfaces of network management
Lec.	**Chapter**	**Class Supporting Equipment's**	**Learning Area**	**Learning Outcome**
16	7. Understand the concept of TDMA cellular mobile communication.	Projector, Internet, Computer You tube Link: Wireless & Mobile Communication | Forward & Reverse Channel of CDMA | AKTU Digital Education - YouTube	7.1 Define the TDMA architecture of cellular mobile system. 7.2 Describe the terms reverse channel and forward channel in TDMA systems. 7.3 Describe the trunk pool techniques in cellular TDMA systems. 7.4 Describe the cellular performance with switch beam antennas.	* After the Class, Students will be able: - to know and forward channel in TDMA systems, Describe the trunk pool techniques in cellular TDMA systems.

17	**Class Test-02**	**Theory Base**	**Chapter – 05, 06**	**Be confident on examination.**
18	**Review class**	**Theory Base**	**Chapter- 04, 05, 06 (Regarding students problem)**	**Be confident of these chapter.**
19	7. Understand the concept of TDMA cellular mobile communication.	Projector, Internet, Computer You tube Link: GSM Frames ll HyperFrame l SuperFrame l MultiFrame l TDMA Frame Explained in Hindi - YouTube	7.5 Describe the cluster planned hierarchal architecture of TDMA system. 7.6 Describe the advantages and disadvantages of TDMA system.	* After the Class, Students will be able planned hierarchal architecture of TDMA system, advantages and disadvantages of TDMA system.
20	8. Understand the concept of CDMA cellular mobile communication	Projector, Internet, Computer You tube Link: IS 95 architecture and features - YouTube	8.1 Define the CDMA architecture of cellular mobile system. 8.2 Define Capacity of cellular CDMA and it types. 8.3 Describe the terms reverse link, forward link capacity and imperfect power control. 8.4 List the features and services of IS-95 CDMA systems.	* After the Class, Students will be able: features and services of IS-95 CDMA systems, Define Capacity of cellular CDMA and it types, forward link capacity and imperfect power control.
21	**Quiz Test-03**	**Theory Base**	**Chapter – 07**	**Be confident on examination.**
Lec.	**Chapter**	**Class Supporting Equipment's**	**Learning Area**	**Learning Outcome**

22	8. Understand the concept of CDMA cellular mobile communication	Projector, Internet, Computer You tube Is 95 call processing and Handoff's in IS 95 - YouTube	8.5 Describe the call processing procedure for mobile and base station in CDMA system. 8.6 Describe the principle of wide band CDMA mobile system. 8.7 Describe the terms diversity, hand-off of IS-95 CDMA systems.	* After the Class, Students will be able : hand-off of IS-95 CDMA systems.

Daffodil Polytechnic Institute

23	9. Understand the features of global mobile satellite systems.	Projector, Internet, Computer You tube Link: Spread Spectrum Satcom Hacking: Attacking The Globalstar Simplex Data Service - YouTube	9.1 Describe the trends towards use of satellite for global mobile personal communication. 9.2 Describe the satellite orbits, high-level network architecture and call flow process for the iridium systems. 9.3 Describe the network architecture and call setup procedure in the global star system.	* After the Class, Students will be able : - network architecture and call setup procedure in the global star system, global mobile personal communication.
24	9. Understand the features of global mobile satellite systems.	Projector, Internet, Computer You tube Link: https://www.youtube.com/watch?v=JV7J7JrakeI	9.4 Describe the overall configuration and call setup procedure for the intermediate circular orbits (ICO). 9.5 Mention the features of teledesic system. 9.6 List the general characteristics of Iridium, Global star, ICO and teledesic systems.	* After the Class, Students will be able : characteristics of Iridium, Global star, ICO and teledesic systems.
25	10.Understand the concept of numbers and identities for mobile communication services.	Projector, Internet, Computer You tube Link: GSM Identifiers- International Mobile Equipment Identity (IMEI) And Theft Prevention - YouTube	10.1 List the numbering related activities in international view. 10.2 Mention the role of mobile / PCS station numbering and identities. 10.3 Mention the international recommendations on numbering and identities.	* After the Class, Students will be able : Mention the international recommendations on numbering and identities.

Lec.	Chapter	Class Supporting Equipment's	Learning Area	Learning Outcome
26	**Class Test-03**	**Theory Base**	**Chapter – 08, 09, 10**	**Be confident on examination.**

Daffodil Polytechnic Institute

27	10. Inverse circular function	Projector, Internet, Computer **You tube Link:** What is UPT & How to Increase it? - YouTube	10.5 Describe the identification plan for terminals and mobile users. 10.6 Describe the numbering plan for mobile networks. 10.7 Describe the application of IMSF and TMSI for location update in GMS. 10.8 Describe the numbering plan for UPT	* After the Class, Students will be able to: - Describe the numbering plan for mobile networks. 10.7 Describe the application of IMSF and TMSI for location update in GMS. 10.8 Describe the numbering plan for UPT
28	11.Understand the concept of performance benchmarks for mobile communication systems and networks and the concept of telecommunication traffic engineering	Projector, Internet, Computer You tube Link: Traffic Measurements in telecommunications Unit5 Lec5 - YouTube	11.1 Mention the key factors that influence the quality of services (QOS) in wireless network. 11.2 Describe the traffic performance for the quality of services in wireless network. 11.3 Describe the transmission performance for the quality of services in wireless network. 11.4 Mention the service levels for telecommunication traffic. 11.5 Define the parameters of a traffic usage. 11.6 Describe different traffic measurements units with problem.	* After the Class, Students will be able to: - Solve problems using formula

29	11.Understand the concept of performance benchmarks for mobile communication systems and networks and the concept of telecommunication traffic engineering	Projector, Internet, Computer **You tube Link:** Webinar: Traffic Congestion Prediction (in mobile networks) - Hendrikx ITC - YouTube	11.7 Describe different types of call and call capacity. 11.8 Mention the typical traffic distribution for mobile application. 11.9 List the categories of data collection.	* After the Class, Students will be able to: - categories of data collection, Mention the typical traffic distribution for mobile.
30	12. Understand the features of channel assignment techniques.	Projector, Internet, Computer **You tube Link:** L12: Fixed Channel allocation in cellular systems | Borrowing - Simple, Complex | MC Lectures - YouTube	12.1 Describe the dynamic (DCA) and fixed channel assignment (FCA) techniques. 12.2 Define the concept of hybrid FCA/DCA schemes. 12.3 Describe the channel segregation with variable threshold.	*After the Class, Students will be able to: channel segregation with variable threshold, the concept of hybrid FCA/DCA schemes.
Lec.	**Chapter**	**Class Supporting Equipment's**	**Learning Area**	**Learning Outcome**
31	12. Understand the features of channel assignment techniques	Projector, Internet, Computer You tube Link: Mobile Communication - Frequency Reuse - Cell Splitting - Handoff Procedure - YouTube	12.4 Describe the concept of directed retry and directed handoff. 12.5 Define the reused partitioning and handoff priority.	* After the Class, Students will be able: reused partitioning and handoff priority.