

NOTIFICATION

No.93 /2018

Date : 09 /08/2018

Subject :- Continuation of Prospectus No. 151734 prescribed for Sem. I to IV of M.Sc. (Applied Electronics) (CGS) for the session 2018-2019.

It is notified for general information of all concerned that the Prospectus No. 151734 prescribed for Semester I to IV of M.Sc. (Applied Electronics) (CGS) for the session 2017-2018 shall be **continued** for the academic **session 2018-2019** along with the following substitutions (minor changes /revised syllabi) for the examination **Semester II, III & IV** of M.Sc. (Applied Electronics) (CGS) as per **Appendix - A** appended herewith as given below :

Sd/-
(Dr. Ajay P. Deshmukh)
Registrar
Sant Gadge Baba Amravati University

Appendix – A

M.Sc. (Applied Electronics) Sem. II

2AE2 : COMMUNICATION ENGINEERING

Unit I : Basics of Electronic Communication

The importance of electronic communication, Definition: Analog signal, Digital signal, Baseband signal, block diagram of basic electronic communication system and explanation of each block, Noise in communication system and types, The electromagnetic spectrum, Concept of transmission bandwidth, modulation, need for modulation **(Fundamental concepts only)**

Unit II : Wave Propagation

Fundamentals of Electromagnetic waves, ground waves, space waves propagation, ionosphere layer, sky waves propagation, concept of actual and virtual height, Definitions of critical frequency, maximum usable frequency, skip distance and skip zone, and concept of fading.

Unit III: Antennas

Antenna fundamentals, concept of Radiation pattern, polarization, bandwidth, beam width, antenna resistance, directivity, power density, antenna gain, Structure, radiation pattern & applications of -Half wave dipole antenna (resonant antenna), folded dipole antenna, Yagi-Uda antenna.

Unit IV : AM transmitters

Amplitude Modulation, Modulation index-definition, its effect on modulated signal, Mathematical representation of amplitude modulated wave, concepts of side band (SSB,DSB), Power relations in AM wave, simple numerical, Circuit and operation of AM modulator using FET, Block diagram of AM transmitter and its operation, advantages, disadvantages, applications of AM.

Unit V : AM receivers

Block diagram of Tuned Radio Frequency receiver and its working, Block diagram of AM super heterodyne receiver and its working, Characteristics of AM radio receiver- Sensitivity, selectivity, fidelity, Image frequency and its rejection **(Theoretical concepts only)**, Demodulation of AM signal, Diode detector, Need of AGC & its types – simple, delayed.

Unit VI : FM transmitter and Receiver

Frequency Modulation, mathematical representation of FM, direct FM Generation using FET, Armstrong circuit diagram and its working, Concept of Pre-emphasis & De-emphasis

FM receiver: Block diagram and explanation of FM Super heterodyne radio receiver, Balanced slope detector.

Text Books: 1) Kennedy G. : Electronic communication system (Mc-Graw Hill) 4th Ed.
2) Dennis Roddy & John Coolen : Electronic communication (PHI) 2ND Ed.

M.Sc. (Applied Electronics) Sem. III

3AE1: DIGITAL COMMUNICATIONS

Unit I : DIGITAL COMMUNICATION SYSTEM

Comparison of analog and digital communication System, advantages-disadvantages of digital communication System, block diagram of digital communication System, source encoder, decoder, Channel encoder, decoder, modulator, demodulator and their important parameters, Concepts of synchronization.

Unit II : INFORMATION THEORY AND CHANNEL CODING

Digital Signal, Bits, bit rate, Probability, laws of probability, joint and conditional probability, information content, rate of information, entropy, Theoretical Concepts of Binary communication channel, discrete communication channel, Channel capacity, Shannon's theorem on channel capacity, Hartley's law, Source coding, Huffman coding algorithm, and simple numerical.

Unit III : DIGITAL MODULATION TECHNIQUES

Digital carrier modulation Schemes, fundamental concepts of coherent Amplitude Shift Keying (ASK), Frequency shift keying (FSK), Phase shift keying (PSK), their transmitter and receiver block diagram and working (only theoretical concepts), comparison of digital modulation systems, block diagram of Differential Phase shift keying (DPSK) transmitter - receiver and working.

Unit IV: ERROR CONTROLLING AND CODING

Introduction to error controlling and coding, Methods of controlling errors, type of errors and codes, linear block codes, Matrix description of linear block code, error detection and error correction capabilities of linear block code and simple numerical.

Unit V : BASE BAND TRANSMISSION

Concept of Base band signals, block diagram and working of base band transmission system, Sampling process, Nyquist sampling theorem (Theoretical concepts only), inter symbol interference, eye diagram and characteristics of eye pattern, scrambler and unscrambler concepts and design.

Unit VI : MODERN TECHNIQUES OF COMMUNICATION

Access techniques: Need of Multiplexing, Time Division Multiple Access (TDMA) and Frequency Division multiple Access (FDMA), Code Division Multiple access (CDMA), comparison of TDMA, FDMA, CDMA.

Introduction to spread spectrum (SS), Pseudo Noise (PN) sequence: definition, generation, Model of Spread Spectrum digital Communication system, D.S. spread spectrum transmitter, receiver and frequency hopping spread spectrum, Theoretical concepts only.

Text Book: Shanmugam K.S. Digital & analog Communication Systems, John Willey & Sons, New York.

3AE41: EMBEDDED SYSTEMS DESIGN

Unit I : Architecture of Microcontroller 89C51:

Introduction to Microcontroller, Block diagram, Architecture, GPR, SFR, Address, Data & Control bus, Memory structure, I/O Ports, Interrupts, Timer/Counter, serial communication (concepts only), Block diagram of architectures of Processors:- Von Neumann, Harvard, RISC, CISC, their comparison.

Unit-II: Introduction to Embedded System:

Embedded Systems versus General Computing Systems, History, advantages and disadvantages, Classification of Embedded System: Small scale, medium scale, sophisticated, stand-alone, real time, Networked, Mobile, major application areas.

Unit-III: Embedded System Design:

Embedded System block diagram, Components of embedded system, characteristics of embedded system, Design Metrics/Specifications- General Purpose and Domain Specific Processors, Processor power, memory, operating system, Reliability, power consumption, flexibility, time-to prototype (concepts only).

Unit-IV: Software Development Tools:

Operation and selection, concepts of-Integrated Development Environment (IDE), Assembler, compiler, cross compiler, Emulator and Flash/OTP Programmer. In-Circuit Emulator (ICE), debugger, Assembly Language - Embedded C comparison, interfacing with LED, relay.

Unit-V: Communication Protocols-

Need of communication interface in embedded system, Serial V/S Parallel Communication, Synchronous V/S Asynchronous Communication, RS232, 8051 connection with RS232, **Concepts of Communication protocols-** Serial Communication Protocol: I2C, CAN, USB, Wireless Communication Protocol: IrDA, Bluetooth, Zigbee, IEEE802.11

Unit-VI: Real Time Operating System

Operating System, Comparison between general purpose OS and RTOS, Architecture of RTOS, functions of RTOS, **concepts of** -various task scheduling algorithms of RTOS, Inter-task Communication, Share data problem-Semaphore, Mutex, Dead lock.

Text Books: 1) Embedded Systems by Raj Kamal, TMH.
2) Introduction to Embedded Systems, Shibu K. V., McGraw-Hill.

Reference Book: Microcontrollers Theory and Applications, Ajay V. Deshmukh, Tata McGrawHill

M.Sc. (Applied Electronics) Sem. IV

4AE3 MOBILE COMMUNICATIONS

Unit I: Introduction to Wireless Communication System

Evolution of mobile radio communications wireless System -1G, 2G, 2.5G and 3G, Mobile radio system around the world (AMPS, IS 95,GSM, N - AMPS), Applications of wireless communication systems - Paging System, Cordless telephone system, Cellular telephone system, Call processing in cellular telephone system.

Unit II: Mobile Unit

Block diagram and operation of mobile Unit, Block Diagram and operation of frequency synthesizer, transmitter, Receiver, Logic Unit and Control unit, Essential features of hand set, Definition of mobile base station, Mobile control station.

Unit III: The Cellular Concept

Introduction to cellular system, Frequency reuse concept, Hand off strategies, Interference and system capacity- Co channel interference & system capacity, Adjacent channel Interference, Power control for reducing Interference, Improving coverage and capacity in cellular system-- Cell splitting, Sectoring, Repeater for range extension, Micro cell zone concept.

Unit IV: Digital Cellular Mobile System G.S.M.

Concept of GSM, GSM Standard, features, service aspects, GSM System Architecture, GSM Radio subsystem, air interface specifications, channel types, frame structure, signal processing.

Unit V: CDMA System (IS-95)

CDMA Digital Cellular standard, Frequency and channel specifications, CDMA System architecture, features of IS-95, comparison of GSM and IS-95 System.

Unit VI: Modern Wireless Communication System

Third Generation (3G) Wireless Networks advantages, 3G W-CDMA (UMTS) (Universal mobile Telecommunication system.), features, 3G CDMA 2000, 3G- TD-SCDMA (synchronous), Wireless local loop , advantages, applications, LMDS (local multipoint distribution), Features of Bluetooth.

****(Only theoretical concepts and working principles, detail mathematical calculation, derivations, numericals NOT EXPECTED for this subject).**

TEXT BOOKS: 1) William CY Lee: "Mobile Cellular Telecommunications"(second Edition) McGraw Hill Inc. (1995)

2) Theodore S. Rappaport: Wireless Communications: Principles & Practice 2nd Edition, Pearson education
