Veer Narmad South Gujarat University, Surat

Syllabus for T Y B Sc (Electronics) Generic Elective w.e.f June 2013

List of Generic Elective subject/paper/course for T Y B Sc Electronics Semester 5 and 6

1) Engineering Graphics
2) Computer Networking
3) Advance Networking and Cyber Security
3) Integrated Circuit Technology
4) Industrial Management
5) OOP Programming
6) Consumer Electronics
7) Advance Microprocessor
8) Python Programming

Engineering Graphics

Unit – 1 : Basic Concept

Introduction to engineering drawing, use of drawing instruments, drawing convention as per latest BIS standard, technical writing-single stroke letters, verticals and inclined letters and numerical, Construction of planes, geometrical partice, parabola, ellipse, hyperbola, cycloid, epi-cycloid, involutes of base circle, Archimedes spiral, cylindrical helix and conical helix

Unit – 2 : Solid Geometry

Orthographic projection of points, lines and planes and their spatial relationship, projections on primary and secondary auxiliary planes, spatial projections of simple plane figures and solids such as prism, pyramids, cylinders and cones and their sections, intersection of planes with solids such as cylinder, cone and spherical profiles.

Unit – 3 : Machine Drawing

Drawing and free hand sketches of machine components as per latest BIS standard such as screwed fastenings, key, splines, cotter & riveted joints, shaft coupling, pipe joint, gears, piston, Concept of limit, fits and tolerance and methods of giving surface specifications on production drawings, mechanical symbols

Computer Networking

Unit – 1 Introduction to LAN

Basic LAN terminology, standards, operation and topology, Network architecture and protocols; Network architecture concepts, Basic concepts of layering, Layers of the OSI Model: application layer, presentation layer, session layer, transport layer, network layer, data link layer, transport layer, Internet layer.

Unit – 2 Data Communication and access technique

Basic concepts, signal encoding techniques, error detection, error correction, data link control. Performance measures and notation, ALOHA; pure ALOHA, slotted ALDHA, carrier sense multiple access; non persistent CSMA, slotted non-persistence CSMA, 1- persistance CSMA, n-persistence CSMA, CSMA with collision detection, control access schemes, polling, token passing, switched access methods. Standard Ethernet, fast Ethernet, its architecture, physical media for 100-Base-T, data encoding for fast Ethernet, network spans using 100-Base-T, Switched Ethernet, Gigabit Ethernet; its architecture, general functions, transmission media, gigabit Ethernet encoding schemes.

Unit – 3

Token Passing LAN, token-ring operation, IEEE-802.5 frame structure, ring configurations, ring management, token-ring performance analysis, dedicated rings, high-speed token rings, FDDI and CDDI; FDDI MAC layer, FDDI Access methods, FDDI physical layer, station management, CDDI/TP-PMD.

Recommended List of Books:

1) Forouzen, TCP/IP Protocol Suit, TMH, New Delhi
2) William Stallings, Data and Computer Communiactions,
3) Gerd Keiser, Local Area Networks, THM, New Delhi
4) M A Miller, LAN Troublshooting Hnadbook, BPB Publications, New Delhi
5) Tanenbaum, Computer Networks, PHI, New Delhi
6) Barry Nawce, Introduction to Networking, Prentice Hall

Advance Networking and Cyber Security

Unit – 1

ATM LAN: ATM fundamentals, its architecture and layers, ATM cell structure, ATM service categories, various ATM Adaptation layers. Wireless LAN: Concepts, its architecture, layers and configuration, MAC layer, operation, services and frame format, Spread-Spectrum Wireless LAN system, frequency- hopping spread spectrum, direct sequence spread spectrum,

Infrared wireless LAN, Physical layer protocols, Wireless PAN; Bluetooth technology, Bluetooth packets, wireless home networking.

Unit – 2

Fiber Channel and SAN: Storage Area Networks (SANs) structure of fiber channel; concept of I/O channel, physical architecture, transmission media, Protocol layers, Fiber channel service classes (class 1,2,3,4,6 services). Internetworking: Internetworking perspective; interconnection methodologies, internet addressing schemes, domain name system, Bridges transparent brides, source routing bridge, translating bridge, Routers and Switches; router types, interface to the internet, router operations generic switch characteristics, LAN switches layer-3 switching, Virtual LAN; its types and IEEE standards.

Unit – 3

Network Management: Basic network management architecture and its functions; performance management, configuration management, accounting management, fault and security management, LAN element management, Network management protocols (SNMP, RMON,SMON), LAN operation management, network planning and simulation tools.

Network Security: Basic security issues and polices, Cryptography, Firewalls, Access control methods, Public-key Infrastructure, IP security, Virtual private network.

Recommended List of Books:

1) Forouzen, TCP/IP Protocol Suit, TMH, New Delhi
2) William Stallings, Data and Computer Communiactions,
3) Gerd Keiser, Local Area Networks, THM, New Delhi
4) M A Miller, LAN Troublshooting Hnadbook, BPB Publications, New Delhi
5) Tanenbaum, Computer Networks, PHI, New Delhi
6) Barry Nawce, Introduction to Networking, Prentice Hall

Integrated Circuit Technology

Unit – 1

Classification of ICs, Electronic grade silicon, Czochralksi and flot zone, crystal gworing methods, oxygen and carbon in silicon, silicon shaping and wafer preparation, Oxidation-thermal, dry & wet, high pressure and plasma oxidation, lithographs-optical lithography, photo-mask, photo-resist and process, X-ray and ion beam lithography, wet chemical etching, reactive plasma etching, impurity doping, diffusion ion implantation, metallization, its desirable properties and applications, Ohmic contacts

Unit – 2

Isolation of circuit elements, bipolar technology, integrated dipoles, semiconductor resistors, capacitors and inductors, MOS and CMOS technology, design of typical ICs, Backside of preparation, Wafer sort, devices separation, die bonding, wire bonding, package types and consideration

Unit – 3

IC Fabrication and pre fabrication stage, Planar process, monolithic transistors-bipolar, fabrication of MOSFET, monolithic diodes, integrated resisters, capacitors, metal-semiconductor contact, characteristics of IC components, monolithic circuit layout

Recommended List of Books :

1) S M Sez, VLSI technology, McGraw Hill
2) I J Nagrath, Electronic Devices and Circuits, PHI, New Delhi

Industrial Management

Unit I : Introduction to Management and Organization

What is management, the history of management, types of manager, management responsibilities, management tasks, the engineering manager Definition of the Organization, Organization Structures, The Quality Organization, Organizational Change, Managing Change

Unit II

the element of corporate strategy, Strategy formulation process, alliance and acquisitions, Strategy formulation tools and techniques the nature of management decision, decision making process, decision making techniques Statistical analysis, presentation of data forcasting and the future, Qualitative methods, the time series, casual models

Unit III

the market, marketing information, market segmentation, consumer and industrial markets Product management, pricing, marketing communications, sales, physical distribution
The nature of leadership, leadership theories, delegation, defining motivation, motivational theories, defining needs, motivation techniques, Communication process, establish communications, presentation.

List of Recommended Books :

1) Engineering Management, Fraidoon Mazda, Low Price Indian Edition, Addison-Wesley
2) Managing Engineering & Technology, Babcock & Morse, Pearson Education

3) Management- A Competency Based Approach, Hlrinegel / Jackson / Slocum, 9th Ed, Thomson South Western

OOP Programming

Unit – 1

Introduction, Need for Object Oriented Programming Basic of OOP, Fundamentals and Qualifiers to Data types, Reference Data types, Variables, Constants, Operator and expressions, Statements: labeled statement, expression statement, compound statement, control statement, Jump statement, declaration statement, Try-Throw-Catch statement.

Unit – 2

Array, Addresses and Pointers, Pointers and Functions, Functions: declaration, definition and call; Inline functions; main function argument; reference variables; function overloading; default argument; parameter passing; recursion, scope of variables; return-by value and return-by-reference; pointers to functions,

Unit – 3

Data abstraction through Classes and User-defined Data type: C-structure; typedef; member class; controlling access to member class, constructor and destructor; copy constructor; dynamic memory management: operators new and delete; malloc and free; static member, scope of class name and variables, operator overloading and class relationship, polymorphism, inheritance.

Recommended Books

1) Debasish Jana, C++ and Object-Oriented Programming Paradigm, PHI, New Delhi
2) E Balagurusamy, Object-Oriented Programming with C++, TMH, New Delhi
3) Herbert Schildt, The complete Reference C++, TMH, New Delhi

Consumer Electronics

Unit – 1 : Audio Systems

Microphones, their types; Carbon, velocity, crystal, condenser, cordless etc. Loud Speaker: Direct radiating, horn loaded woofer, tweeter, mid range, multi-speaker system, baffles and enclosures. Sound recording on magnetic tape, its principles, block diagram and tape transport mechanism, Digital sound recording on tape and disc, CD system, Hi-Fi system, pre-amplifier, amplifier and equalizer system, stereo amplifiers , public address systems, Graphics Equalizer, speed Synthesizer, Electronic tuning.

Unit – 2 : Video Systems

Color TV and HD TV systems, LCD, LED, PLASMA Systems, Electronic cameras, VCR, VCP, CD systems, Memory diskettes, Discs and drums. Dolby noise reduction digital and analog recording. Digital projection systems (LCD, DLP, SVGA to UXGA system) Block diagram and principles of working of cable TV and DTH, cable TV using internet.

Unit – 3 : Home and Office Systems

Conventional telephone block diagram, Conventional telephone troubles and solutions, Static and phone noise checks, Low sound or distortion, DTMF touch pad problems, Basic cordless phone operation, Cordless phone base unit circuitry, Portable handset unit, Cordless phone troubles and correction hints, cellular phone system, cell phone operation, Transmit/receive section, CPU and memory logic, PocketNet portables, Ultrasonic remote transmitter, IR remote-control transmitter,

Construction and working principles of Dot Matrix Printer, Inkjet Printer, Laser Printer, Printer Controller, Concentric Interface, Signals from PC to Printer & Printer to PC. Product safety and liability issues; standards related to electrical safety and standards related to fire hazards, e.g. UL and VDE. EMI/EMC requirements and design techniques for compliance, e.g. ESD, RF interference and immunity, line current harmonics and mains voltage surge

Recommended List of Books:

1) Bali S.P , “Consumer Electronics”, Pearson Education, 2007
2) K. Blair, Benson “Audio Engineering Hand book”, 2001
3) R.R Gulati, “Colour Television-principles & practice”,Wiley Eastern Limited, New Delhi, 2008
4) R.R Gulati, “Complete Satellite & Cable Television”, New age International Publisher, 2008
5) RC Vijay, “Colour Television Servicing”, BPB Publication, New Delhi, 2007

Advance Microprocessor

Unit – 1 : Architecture and Fundamental Block Diagram of Microprocessor 8086

Features of 16 Bit HMOS Microprocessor, 1.2 Pin Configuration of Microprocessor 8086; Common Pins,Minimum Mode Pins of Microprocessor 8086, Maximum Mode Pins of Microprocessor 8086,1.3 Architecture of Microprocessor 8086; General Purpose Register, Operand Register or Temporary Registers, Arithmetic Logical Unit (ALU), Flag Registers, 1.4 Instruction Queue and Pipelining, 1.5 Segmentation of Memory Used with 8086, 1.6 Methods of Generating Physical Address in Microprocessor 8086, 1.7 Memory Pointer; IP Register, SP Register, BP Register, BX, SI and DI Register, Use of SI and DI in String Instruction, Default and Specified Segment Registers of Memory Pointers

Unit – 2 : Instruction Sets and Programming of Microprocessor 8086

Instruction, Data Transfer Instructions; Move Source Data into Destination, Exchange the contents of Destination and Source, Load AH Register with 8 LSBs of Flag Register, Store Register AH into 8 LSBs of Flag Register, Data Memory Segment and Given Register R (16 Bit Register) with Memory Contents, Load Effective Address of Memory into Given Register R, Translate/ Translate Byte, Stack Instructions; Input and Output Instruction, Arithmetic Instructions, Logical Instruction

Unit – 3 Other 16-Bit Microprocessors 80186 and 80286

Introduction to the Microprocessor 80286,Pin Configuration of Microprocessor 80286, Architecture of Microprocessor 80286, Register of Microprocessor 80286, Protection Mechanism and Protection Level in 80286 Microprocessor, 32-Bit Microprocessor 80386, 80486 and Introduction to Pentium Families, Features of 80386 Microprocessor, The 80486 Microprocessor, Advancement of 80486 DX Microprocessor Over 80386 DX Microprocessor, Architecture of Microprocessor 80486, Pin Configuration of the 80486 Microprocessor, Introduction to the Pentium Processor, A Brief History of Pentium Processor, Advanced Features of Pentium Processor, Architecture of the Pentium Processor, An Overview of Pentium Pro Processor, An Overview of Pentium II Processor, An Overview of Pentium III Processor, An Overview of Pentium IV Processor

Recommended List of Book:

1) Nilesh B Bahadure, Microprocessors The 8086/8088, 80186/80286, 80386/80486 and the Pentium Family, PHI, New Delhi

Python programming and Computer Interfacing

Unit – 1

Introduction to LINUX Operating System, Installation of LINUX, Filing system, Desktop and other menu, terminal window, general commands like ls, cd, mkdir etc..., installing packages in Linux, text editor, opening, saving and editing files with gedit, getting help.

Unit – 2

2.1 getting started Introduction to programming, introduction to compilers and interpreters, understanding python interpreter, editing and execution environment 2.2 Lexical Structure and operators Values and types, variables, variable names and keywords, statements, operators and operands, expressions, order of operation, string operation, comments, lines and indentation, data type, lists and tuple, 2.3 Iteration and Decision making WHILE structure, importance of indentation, writing programmers for the while structure, for statement and the range, programming with for statement, Decision making if , else if, and else statements, programming

Unit – 3

3.1 Modular Python Functions, passing parameters, local variables programming, concept of libraries Study of various python library 3.2 Phoenix Introduction the Phoenix, understanding various aspects of Phoenix, understanding the phoenix library, phoenix library functions, programming the phoenix, applications of phoenix Introduction to data analysis, errors, handling errors, error minimization techniques, Least Square Method for Linear Fitting, using GRACE for data analysis, importing data, curve fitting, other data analysis techniques.

Reference Books

1. Introduction to Linux
2. A Byte of Python BY Swaroop C H
3. Beginning Python From Novice to Professional Second Edition BYMagnus Lie Hetland
4. Core Python Programming, Second Edition BY Wesley J. Chun Prentice Hall
5. Learning Python Fourth Edition BY Mark Lutz O'REILLY
6. Python Create modify and reuse BY Jim Knowlton Wiley