

DEENBANDHU CHHOTU RAM UNIVERSITY OF SCIENCE & TECHNOLOGY, MURTHAL (SONEPAT)
SCHEME OF STUDIES AND EXAMINATION
B. TECH. IV YEAR (ELECTRONICS & COMMUNICATION ENGINEERING)
SEMESTER VII
Credit Based Scheme w.e.f. 2015-2016

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Exam. Marks		Total Marks	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	ECE401B	INDUSTRIAL PROCESS CONTROL AND INSTRUMENTATION(ECE,AEI)	3	1	-	25	75	-	100	4	3
2	ECE403B	DIGITAL SIGNAL PROCESSING(ECE,AEI)	3	1	-	25	75	-	100	4	3
3	ECE405B	SATELLITE COMMUNICATION	3	1	-	25	75	-	100	4	3
4	ECE407B	VLSI DESIGN(ECE,AEI,EEE)	3	1	-	25	75	-	100	4	3
5		*OPEN ELECTIVE	4	-	-	25	75	-	100	4	3
6	ECE421B	PROGRAMMABLE LOGIC CONTROLLERS LAB(ECE,AEI)	-	-	2	20	-	30	50	1	3
7	ECE423B	DIGITAL SIGNAL PROCESSING LAB using MATLAB(ECE,AEI)	-	-	2	20	-	30	50	1	3
8	ECE425B	SATELLITE COMMUNICATION LAB	-	-	2	20	-	30	50	1	3
9	ECE427B	VLSI DESIGN LAB(ECE,AEI)	-	-	2	20	-	30	50	1	3
10	ECE431B	PROJECT	-	-	4	100	-	-	100	4	-
11	ECE435B	PROFESSIONAL TRAINING – II	-	-	2	50	-	-	50	2	-
Total			16	4	14	355	375	120	850	30	

LIST OF OPEN ELECTIVES:

1	MEI 623B	ENTREPRENEURSHIP	6	BT401B	BIOINFORMATICS
2	BME451B	MEDICAL INSTRUMENTATION	7	AE417B	MODERN VEHICLE TECHNOLOGY
3	ECE305B	CONSUMER ELECTRONICS	8	CE451B	POLLUTION & CONTROL
4	EE451B	ENERGY AUDIT	9	CSE411B	MANAGEMENT INFORMATION SYSTEM
5	EEE457B	ENERGY RESOURCES & TECHNOLOGY	10	IT413B	CYBER SECURITY

Note:

- Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Sports is given in General Proficiency Syllabus.
- Students will be permitted to opt for any one elective run by the other department. However, the department shall offer those elective for which they have expertise. The choice of the students for any elective shall not be binding for the department to offer, if the department does not have expertise. The minimum strength of the students should be 20 to run an elective course.
- Assessment of Professional Training-II, undergone at the end of VI semester, will be based on seminar, viva-voce, report and certificate of Professional Training obtained by the student from the industry, institute, research lab, training center etc
- The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.
- Assessment Electronics gadgets including Cellular phones are not allowed in the examination.

ECE401B

INDUSTRIAL PROCESS CONTROL AND INSTRUMENTATION

Approved by UG BOS & FET

B. Tech Semester –VII (ECE, AEI)

L T P Credits
3 1 - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

UNIT I

Discrete Fourier Transform (DFT):

Frequency Domain Sampling and Reconstruction of Discrete –Time signals, Discrete Fourier Transform, DFT as a Linear Transformation, Relationship of the DFT to other transforms, Properties of DFT, Use of DFT in Linear filtering methods: linear filtering, Filtering of long data sequences.

Fast Fourier Transform (FFT):

Efficient computation of the DFT: Fast Fourier Transform Algorithms, Radix-2 FFT Algorithms, Applications of FFT Algorithms: Efficient Computation of the DFT of Two Real Sequences, Efficient Computation of the DFT of a $2N$ –Point Real Sequence, Quantization effects in the computation of the DFT.

UNIT II

Structures for FIR Systems:

Direct –Form Structures, Cascade –Form Structures, Frequency Sampling Structures, Lattice Structure.

Structures for IIR Systems:

Direct –Form Structures, Signal Flow graphs & Transposed Structures, Cascade –Form Structures, Parallel –Form Structures; Lattice & Lattice-Ladder Structures for IIR Systems. Comparison of Different structures.

UNIT III

Frequency Domain Characterization of LTI Systems:

Response to Complex Exponential & Sinusoidal Signals, Steady –state and Transient response with Input as a sinusoidal signal, Steady state response to periodic input signals, response to Aperiodic Input Signals, magnitude and phase response from pole & zeros, measuring the impulse response of an unknown system by correlation.

Frequency Selective Filters

Ideal Filters: lowpass, Highpass, Bandpass, Digital Resonators, Notch, Comb, All-pass filters, Digital Sinusoidal Oscillators pole –zero pattern for lowpass and highpass filters, lowpass to highpass filter transformation, Invertibility of systems & Deconvolution: LTI systems invertibility, maximum, minimum phase, and mixed phase systems; System identification through Crosscorrelation, Spectrum.

UNIT IV

Considerations for Practical Realization, Comparison of FIR & IIR, FIR Filter Design :

Testing the Frequency response for practical realization: Paley –Wiener Theorem, characteristics of Practical Frequency –selective filters, FIR and IIR filters properties, Design of FIR filters: importance of Linear Phase response, Zero locations for a linear phase FIR filter, Design of linear phase FIR filters using Windows, Desirable Window function properties for FIR filter design, Frequency Sampling method for Linear Phase FIR Filter Design.

IIR Filter Design

Design steps for IIR Filter design, Design of IIR lowpass analog filters: Butterworth, Chebyshev, Elliptic; Conversion of analog system to digital system by: Approximation of Derivatives, Impulse Invariance, Bilinear Transformation, Analog Domain Frequency Transformations, Digital Domain Frequency Transformations.

Text Books :

1. J. G. Proakis, D. G. Manolakis, "Digital Signal Processing, Principles, Algorithms, & Applications", Prentice –Hall India.

Reference Books:

1. L. R. Rabiner & B. Gold, "Theory and Application of Digital Signal Processing", Prentice –Hall India.
2. A. V. Oppenheim, R. W. Schaffer, J. R. Buck, "Discrete –Time Signal Processing", Prentice –Hall India.
3. A. V. Oppenheim, R. W. Schaffer, "Digital Signal Processing", Prentice –Hall India.

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

ECE405B

SATELLITE COMMUNICATION

Approved by UG BOS & FET

B. Tech Semester –VII

L T P Credits
3 1 - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

UNIT I

FUNDAMENTALS OF SATELLITE COMMUNICATION :

Basic principles of Satellite Communication, Evolution of Satellite Communications, Basic Concepts of Satellite Communications, Type of satellites, Frequency allocations for Satellite Services, Comparison of Satellite communication over other modes of communication, Satellite applications, Future Trends of Satellite Communications.

SATELLITE ORBITS:

Kepler's Laws, equation of orbit, Types of orbits, Locating the satellite in the orbit, locating the satellite with respect to the earth, Orbital parameters, Orbital perturbations, Orbit determination, Look Angle determination, Earth coverage and slant range, Mechanism of launching a satellite, Station keeping, Satellite stabilization, Orbital effects in communication systems performance.

UNIT II

SPACECRAFT AND ITS SUBSYSTEMS:

Attitude and orbit control system (AOCS), Telemetry, tracking, Command and monitoring, Power supply system, Communication subsystems-transponder, Satellite antenna subsystem.

SATELLITE LINK DESIGN:

General Link design equation, System noise temperature, C/N and G/T ratio, Design of down links, up link design, Effects of rain, complete link design, Interference effect on complete link design.

UNIT III

EARTH STATION TECHNOLOGY:

Classification of earth station, Earth station parameters, Earth station design requirements, Earth station antenna design, Earth station subsystem-transmitter, receiver, low noise amplifier, high power amplifier, antenna system, tracking systems, Terrestrial interface.

ANALOG and DIGITAL SATELLITE DIGITAL COMMUNICATION:

Elements of Digital Satellite Communication systems, Baseband Signals, Frequency Division Multiplexing technique, Time Division Multiplexing Digital Modulation Techniques-ASK, BPSK, QPSK, BFSK, MSK and QAM.

UNIT IV

MULTIPLE ACCES:

Introduction, Frequency division multiple access (FDMA), Time division Multiple Access (TDMA)-frame structure, burst structure, frame efficiency, super frame, burst time plan, Satellite Switched TDMA, SPADE system, Code Division Multiple access (CDMA), Spread spectrum transmission and reception.

SPECIAL PURPOSE COMMUNICATION SATELLITE :

Satellite for earth observation, Satellite for weather forecast, Satellite for scientific studies, Satellite for military applications, Satellite television, telephone services via satellite, Data communication services, Very small aperture terminal (VSAT), RADARSET, Mobile satellite communication system (MSAT), GPS systems, Satellite signal acquisition, GPS Navigation Message, GPS signal levels, GPS receiver operation, Differential GPS.

Text Books:

1. Satellite Communications : Dennis Roddy, TMH
2. Satellite Communication : Monojit Mitra, PHI

Reference Books:

1. Satellite Communication: T. Pratt and C.W. Boston, John Willey and sons
2. Introduction to Satellite Communication: Bruce R. Elbert, Artech House
3. Fundamentals of satellite Communication: K.N.Raja Rao, PHI
4. Satellite Communication Systems Engineering : Wilbur L. Pritchard, Henri G. Suyderhoud and Robert A. Nelson, Pearson

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

ECE407B

VLSI DESIGN

Approved by UG BOS & FET

B. Tech Semester –VII (ECE, AEI, EEE)

L	T	P	Credits	Class Work	:	25 Marks
3	1	-	4	Theory	:	75 Marks
				Total	:	100 Marks
Duration of Exam. :				3 Hrs.		

UNIT I

INTRODUCTION:

Evolution of VLSI, Moore's Law, MOS transistor theory – MOS structure, enhancement & depletion transistor, Threshold voltage, MOS device design equations, Body Effect, Channel length modulation, Mos Transistor Trans conductance and output conductance.

MOS FABRICATION:

Crystal Growth, wafer preparation, epitaxy, oxidation, lithography, etching, diffusion, deposition, ion-implantation, metallization, Fabrication Process: nMOS, CMOS (n-well, p-well, twin-tub, silicon on insulator, 3-D CMOS, MOS capacitance dynamic behavior, sub-micron MOS transistors- related effects.

UNIT II

MOS INVERTER:

Introduction, nMOS inverter: resistive load, enhancement load, depletion load, determination of pull-up to pull-down ratio for an nMOS inverter driven by another nMOS inverter. CMOS inverter: DC characteristics, circuit model, latch up.

CMOS DESIGN:

Gate Logic: inverter, nand gate, nor gate. Ratioed logic, pseudo NMOS logic, DCVSL Logic, Switch Logic: pass transistor and transmission gate, dynamic logic, charge sharing logic, domino logic. Combination logic: Parity generator, multiplexer. Sequential logic: two phase clocking, memory-latches and registers, setup and hold time violations, causes ,effects and remedies.

UNIT III

MOS circuit Design :

MOS layer, stick diagram: nMOS Design style, CMOS design style, design rules and layout: lambda based design rule, layer representation, contact cuts, double metal MOS process rules, CMOS lambda based design rules.

SCALING OF MOS CIRCUITS:

Scaling models and scaling factors for device parameters, limitations of scaling: substrate doping, limits of miniaturization, limit of interconnect and contact resistance.

UNIT IV

CIRCUIT CHARACTERIZATION AND PERFORMANCE ESTIMATION:

Sheet resistance, resistance estimation, capacitance estimation, inductance, switching characteristic, propagation delays, CMOS gate transistor sizing, power dissipation: static and dynamics.

SUB-DESIGN PROCESS:

Design of an ALU subsystem: 4-bit shifter, barrel shifters, logarithmic shifters. Adders – ripple carry, Manchester carry, carry bypass, carry select linear, carry select square root, carry look ahead, tree and domino adder .Multiplier – binary , array, carry save, Wallace tree, Programmable logic array, random access memory, binary counter.

Text Books :

1. D.A.Pucknell and K. Eshraghian, "Basic VLSI Design"
2. Weste and Eshraghian, "Principle of CMOS VLSI Design" Pearson Education, 2001

Reference Books:

1. S. M. Kang, Y. Leblebici, "CMOS digital integrated circuits analysis & design" TMH, 3rd Edition.
2. Rabaey, "Introduction of digital integration circuit".

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

ECE421B

PROGRAMMABLE LOGIC CONTROLLERS LAB

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B. Tech Semester –VII (ECE, AEI)

L	T	P	Credits	Class Work	:	20 Marks
-	-	2	1	Practical	:	30 Marks
Duration of Exam. :				Total	:	50 Marks

LIST OF EXPERIMENTS:

1. To study of PLC based Process control systems in a semi-automatic Bottling plant.
2. To study of PLC based Process control systems in a fully-automatic Bottling plant.
3. To Study of PLC based car parking.
4. To study of PLC based tank level control (high level,medium level,low level,empty level)
5. To study of PLC based step sequence.(use of time at different time interval)
6. How to create delay in PLC system.(off delays,pulse,extended pulse)
7. To study of PLC based light intensity variation.(intensity variation with help of digital processing)
8. To study of PLC based motor control (stepper motor clockwise,anticlockwise dectional control)
9. To study of PLC based digital electronic design (combinational,sequentional and control logic ckt.)
10. To study of PLC based traffic light interface.

Note:-

1. Total ten experiments are to be performed in the semester
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed and set by the concerned institution as per the scope of the syllabus.

ECE423B

DIGITAL SIGNAL PROCESSING LAB USING MATLAB

B. Tech Semester –VII (ECE, AEI)

L	T	P	Credits	Class Work	:	20Marks
-	-	2	1	Practical	:	30Marks

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Duration of Exam. :

3 Hrs.

Total :

50Marks

LIST OF EXPERIMENTS:

1. Introduction to MatLab.
2. Matrix operations :- Addition, Subtraction, Multiplication, Transpose, Inverse.
3. Solution of a Linear Equation.
4. To find Eigen value of matrix.
5. To find statistical properties :- Mean, Median, Standard Deviation and energy of a set of signals.
 - Plotting.
 - Single signal in a single graph.
 - Multiple signal in single graph.
 - Multiple signal in multiple graphs but in single window.
6. To sort a matrix.
 - Row wise – in reference to a particular row.
 - Column wise – in reference to a particular column.
7. To practice different kind of loop and conditional statement and to make a program using the same.
8. To save workspace variables in a file.
9. To make a simulink model of feedback system using second order transfer function and utility feedback.
10. To find the convolution of two number.
11. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
12. To develop program for discrete convolution & discrete correlation.
13. To understand stability test.
14. To develop program for computing FFT & IDFT.
15. To design analog filter (low-pass, high pass, band-pass, band-stop).
16. To design digital IIR filters (low-pass, high pass, band-pass, band-stop).
17. To design FIR filters using windows technique.
18. To design a program to compare direct realization values of IIR digital filter
19. To develop a program for computing parallel realization values of IIR digital filter.
20. To develop a program for computing cascade realization values of IIR digital filter
21. To develop a program for computing inverse Z-transform of a rational transfer function.
22. To design equiripple FIR filter for given specifications and plot its magnitude & Phase Response.
23. To plot pole zero diagram for given FIR and IIR system.

Note:-

- 1 Total fifteen experiments are to be performed in the semester
- 1 At least Ten experiments should be performed from the above list. Remaining Five experiments should be performed as designed and set by the concerned institution as per the scope of the syllabus.
- 2 All above experiments should be performed using MATLAB.

ECE425B

SATELLITE COMMUNICATION LAB

B. Tech Semester –VII

L T P Credits
- - 2 1

Class Work : 20Marks
Practical : 30Marks
Total : 50Marks

Duration of Exam. :

3 Hrs.

LIST OF EXPERIMENTS:

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1. To set up a active and passive satellite communication link and study their difference.
2. To measure the base-band analog (voice) signal parameters in the satellite link.
3. To measure C/N ratio.
4. To transmit and receive the function generator waveforms through a Sat.Com. link.
5. To measure the digital baseband signal parameters in Sat.Com. link.
6. To send telecommand and receive the telemetry data.
7. To set a PC to PC Sat. Com. Link using RS-232 ports.
8. To measure the propagation delay of signal in a Sat. Com. Link.
9. To measure fading of a received signal.
10. To measure the parameters in an analog FM/FDM TV Sat.Com. link.
11. To measure the S/N ratio.
12. To calculate the figure of merit and FM deviation.

Note:-

- 1 Total ten experiments are to be performed in the semester
- 1 At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed and set by the concerned institution as per the scope of the syllabus.

ECE427B

VLSI DESIGN LAB
B. Tech Semester –VII (ECE, AEI)

L	T	P	Credits		Class Work	:	20 Marks
-	-	2	1		Practical	:	30 Marks
					Total	:	50 Marks

Duration of Exam. : 3 Hrs.

LIST OF EXPERIMENTS:

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1. Design the schematic for CMOS inverter .
2. Design the schematic for CMOS nand gate
3. Design the schematic for CMOS nor gate .
4. Design the schematic for a d- latch with clk time period =6ns using nand gates
5. Design the schematic for a half adder using nand gates .
6. Design a full adder using half adder designed above.
7. Design the layout for PMOS in layout editor.
8. Design the layout for NMOS in layout editor.
9. Design the layout for CMOS inverter with equal rise and fall time in layout editor.
10. Design the layout for 2-Input and 3-Input NAND gate.
11. Design the layout for 2-Input and 3-Input NOR gate.
12. Design the layout for clocked S-R flip-flop.

Note:-

- 1 Total ten experiments are to be performed in the semester
- 2 At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed and set by the concerned institution as per the scope of the syllabus.

ECE431B

PROJECT
B. Tech Semester –VII

L	T	P	Credits		Class Work	:	100 Marks
-	-	4	4		Practical	:	-
					Total	:	100 Marks

The project started in VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

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Head/ Chairperson of Department	: Chairperson
Project coordinator	: Member
External examiner	: To be appointed by the University

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of, maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

ECE435B

PROFESSIONAL TRAINING – II
B. Tech Semester –VII

L	T	P	Credits
-	-	2	2

Class Work	:	50 Marks
Practical	:	-
Total	:	50 Marks

At the end of 6th semester each student would undergo four weeks Professional Training in an Industry/ Institute/ Professional / Organization/ Research Laboratory etc. with the prior approval of the Training and Placement Officer of the University and submit in the department a typed report along with a certificate from the organization.

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The typed report should be in a prescribed format.

The report will be evaluated in the VII Semester by a Committee consisting of three teachers from different specialization to be constituted by the Chairperson of the department. The basis of evaluation will primarily be the knowledge and exposure of the student towards different processes and the functioning of the organization.

The student will interact with the committee through presentation to demonstrate his/her learning.

Teachers associated with evaluation work will be assigned 2 periods per week load.

MEI623B

ENTREPRENEURSHIP
B. Tech Semester –VII (Open Elective)

L	T	P	Credits
4	-	-	4

Class Work	:	25 Marks
Theory	:	75 Marks
Total	:	100 Marks

Duration of Exam. : 3 Hrs.

UNIT I

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ENTREPRENEURIAL DEVELOPMENT PERSPECTIVE: Concepts of Entrepreneurship Development, Evolution of the concept of Entrepreneur, Entrepreneur Vs. Intrapreneur, Entrepreneur Vs. Entrepreneurship, Entrepreneur Vs. Manager, Attributes and Characteristics of a successful Entrepreneur, Role of Entrepreneur in Indian economy and developing economies with reference to Self-Employment Development, Entrepreneurial Culture.

UNIT II

CREATING ENTREPRENEURIAL VENTURE: Business Planning Process, Environmental Analysis - Search and Scanning, Identifying problems and opportunities, Defining Business Idea, Basic Government Procedures to be complied with.

UNIT III

ENTREPRENEURSHIP DEVELOPMENT AND GOVERNMENT: Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available; Role of Central/State agencies in the Entrepreneurship Development - District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB).

UNIT IV

PROJECT MANAGEMENT AND CASE STUDIES: Technical, Financial, Marketing, Personnel and Management Feasibility, Estimating and Financing funds requirement - Schemes offered by various commercial banks and financial institutions like IDBI, ICICI, SIDBI, SFCs, Venture Capital Funding, Why do Entrepreneurs fail - The Four Entrepreneurial Pitfalls (Peter Drucker), Case studies of Successful Entrepreneurial Ventures, Failed Entrepreneurial Ventures and Turnaround Ventures.

Text & Reference Books:

1. Entrepreneurship - Hisrich Peters.
2. Entrepreneurship: New Venture Creation - David H. Holt.
3. The Culture of Entrepreneurship - Brigitte Berger.
4. Project Management - K. Nagarajan.
5. Dynamics of Entrepreneurship Development - Vasant Desai.
6. Entrepreneurship Development - Dr. P.C. Shejwalkar.
7. Thought Leaders - Shrinivas Pandit.
8. Entrepreneurship, 3rd Ed. - Steven Brandt.
9. Business Gurus Speak - S.N. Char.
10. The Entrepreneurial Connection - Gurmit Narula.

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

BME451B

MEDICAL INSTRUMENTATION

B. Tech Semester –VII (Open Elective)

L T P Credits
4 - - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

UNIT I

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PHYSIOLOGY AND TRANSDUCERS: Cell and its structure – Action and resting – Potential propagation of action potential – Sodium pump – Nervous system – CNS – PNS – Nerve cell – Synapse – Cardio pulmonary system – Physiology of heart and lungs – Circulation and respiration – Transducers – Different types – Piezo-electric, ultrasonic, resistive, capacitive, inductive transducers – Selection criteria.

UNIT II

ELECTRO – PHYSIOLOGICAL AND NON-ELECTRICAL PARAMETER MEASUREMENTS: Basic components of a biomedical system – Electrodes – Micro, needle and surface electrodes – Amplifiers – Preamplifiers, differential amplifiers, chopper amplifiers – Isolation amplifier. ECG – EEG – EMG – ERG – Lead systems and recording methods – Typical waveforms. Measurement of blood pressure – Cardiac output – Cardiac rate – Heart sound – Respiratory rate – Gas volume – Flow rate of CO₂, O₂ in exhaust air - PH of blood, ESR, GSR measurements – Plethysmography.

UNIT III

MEDICAL IMAGING AND PATIENT MONITORING SYSTEMS: X-ray machine - Radio graphic and fluoroscopic techniques – Computer tomography – MRI – Ultrasonography – Endoscopy – Thermography – Different types of biotelemetry systems and patient monitoring – Electrical safety. Biological effects of X-rays and precautions.

UNIT IV

ASSISTING AND THERAPEUTIC EQUIPMENTS: Pacemakers – Defibrillators – Ventilators – Nerve and muscle stimulators – Diathermy – Heart – Lung machine – Audio meters – Dialyzers. Respiratory Instrumentation - Mechanism of respiration, Spirometry, Pneuotachograph Ventilators.

Text Books:

1. Biomedical Instrumentation and Measurements – Leslie Cromwell and F.J. Weibell, E.A. Pfeiffer, PHI, 2nd Ed, 1980.
2. Medical Instrumentation, Application and Design – John G. Webster, John Wiley, 3rd Ed., 1998.

Reference Books:

1. Principles of Applied Biomedical Instrumentation – L.A.Geoddes and L.E. Baker, John Wiley, 1975.
2. Hand-book of Biomedical Instrumentation – R.S. Khandpur, TMH, 2nd Ed., 2003.
3. Biomedical Telemetry – Mackay, Stuart R., John Wiley, 1

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

ECE305B

CONSUMER ELECTRONICS

B. Tech Semester –VII (Open Elective)

L T P Credits
3 1 - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

UNIT I

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MONOCHROME TV (INTRODUCTION):Elements of a TV System,Picture transmission,Sound transmission,Picture reception,Sound reception,Synchronization,Receiver control,Image continuity, Scanning Process, Aspect Ratio, Flicker, Composite Video Signal, Picture Elements,Kell factor, Vertical Resolution,Horizontal Resolution,Video bandwidth,Interlacing, 625 Line System,Bandwidths for TV Transmission,Vertical and horizontal synch detail,Vestigial Side Band transmission(Advantages and Disadvantages)

Monochrome TV (Picture and Camera Tubes):Monochrome picture tube,beam reflection,Beam focussing,Screen Phosphor,Face plate,Picture tube characteristics,picture tube circuit controls,Monochrome Camera Tubes:Basic principle,Image Orthicon, Vidicon,Plumbicon

UNIT II

Colour TV Essentials:Compatibility , Colour perception,Three Colour theory,Luminance,Hue and Saturation, Dispersion and Recombination of light,Primary and secondary colours,luminance signal,Chrominance Signal, Colour picture tube,colour TV Camera,Colour TV display Tubes,colour Signal Transmission,Bandwidth for colour signal transmission,Colour TV controls. Cable TV,Block Diagram and principle of working of cable TV.

Plasma and LCD:Introduction,liquid crystals,types of LCD's,TN,STN,TFT,Power requirements,LCD working,Principle of operation of TN display,Construction of TN display,Behaviour of TN liquid crystals,Viewing angle,colour balance, colour TN display, limitations, advantages, disadvantages, applications.

UNIT III

LED and DMD:Introduction to LED Television , comparison with LCD and Plasma TV's, schematic of DMD, introduction to Digital MicroMirror device, Diagram of DMD, principle of working, emerging applications of DMD.

Microwave Ovens and Air Conditioners:Microwaves,Transit Time,Magnetron,Waveguides,Microwave Oven,Microwave Cooking. Air conditioning,Components of air conditioning systems,all water Air conditioning systems,all air air conditioning Systems,Split air conditioner.

UNIT IV

Microphones:Introduction, characteristics of microphones,types of microphone:carbon,moving coil,wireless,crystal,introduction to tape recorder.

Loudspeaker:Introduction to ideal and basic loudspeaker,loudspeaker construction types of loudspeaker: Dynamic and permanent magnet,woofers,tweeters,brief introduction to baffles,equalisers.

Text Books:

1. Consumer Electronics by S. P. Bali(Pearson Education)
2. Complete Satellite and Cable T.V by R.R Gulati(New Age International Publishers)

Reference Books:

1. Monochrome and Colour Television by R. R. Gulati

NOTE:

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EE451B

ENERGY AUDIT

B. Tech Semester –VII (Open Elective)

L T P Credits
4 - - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

Approved by UG BOS & FET

UNIT I

INTRODUCTION TO THE POWER DISTRIBUTION SYSTEM: Description of the power distribution system- voltage levels, Components of the distribution system- Substation, Transformer, feeders, distribution system planning, operation & maintenance objectives, activities involved in O&M, grid management, load scheduling & dispatch, load balancing, 66-33/11 KV substation equipment, 11/0.4 KV substation equipment, Distribution transformers- reasons for DT failures.

UNIT II

ENERGY ACCOUNTING & ENERGY AUDIT: Need for energy accounting, objectives & functions of energy accounting, Energy flow diagram in power distribution system, energy accounting procedure- Energy measurement, and problems in energy accounting & overcoming these problems in energy accounting, Definition, need and types of energy audit, energy audit instruments, procedure for conducting an energy audit.

UNIT III

AT&C LOSS REDUCTION & EFFICIENCY IMPROVEMENT: Concepts and principles of distribution losses- transmission & distribution losses, AT&C losses in power distribution network, factors contributing to high technical & commercial losses. Technical loss reduction- Short term measures for technical loss reduction, long term plans for technical loss reduction, Commercial loss reduction- reasons for commercial losses, measures for commercial loss reduction.

UNIT IV

DEMAND SIDE MANAGEMENT: An introduction, Why DSM?, Benefits of DSM, DSM in power systems: load management, DSM techniques and emerging trends, EC Act 2001, DSM on consumer side – the industrial sector, the agricultural sector, the domestic & commercial sectors, ESCO-a route for DSM.

Text Books:

1. Handbook of Energy Engineering, The Fairmont Press, INC.-Albert Thumann & Paul Mehta.
2. Energy Management Supply & Conservation, Butterworth Heinemann, 2002-dr. Clive Beggs.

Reference Books:

1. Handbook on energy audit & environment management by ISBN 81-1993.0920 TERI.

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

EEE457B

ENERGY RESOURCES & TECHNOLOGY

B. Tech Semester –VII (Open Elective)

L	T	P	Credits
4	-	-	4

Class Work	:	25 Marks
Theory	:	75 Marks
Total	:	100 Marks

Duration of Exam. : 3 Hrs.

Approved by UG BOS & FET

UNIT I

ENERGY SOURCES & AVAILABILITY: World energy situation. Indian energy scenario. Comparative study of thermal, hydro, nuclear and gas power plants. Impact of thermal, gas, hydro and nuclear power stations on environment, air and water pollution, green house effect (global warming), Plasma confinement - magnetic confinement and inertial confinement, geothermal, hydrogen energy, fuel cells, Alkaline fuel cells (AFC), Solid oxide fuel cell (SOFC), Molten carbonate fuel cells (MCFC), thermo-electric power, MHD power generation OTEC & tidal waves.

UNIT II

SOLAR ENERGY: Solar constant, solar radiation geometry, local solar time, day length, solar radiation measurement, radiation on inclined surface, solar radiation data & solar charts. Flat plate collectors, liquid and air type. Theory of flat plate collectors, advanced collectors, optical design of concentrators, selective coatings, solar water heating, solar dryers, solar stills, solar cooling and refrigeration. Thermal storage. Conversion of heat into mechanical energy. Active and passive heating of buildings. Solar cells.

UNIT III

WIND ENERGY: Wind as a Source of Energy, Characteristics of wind, wind data. Horizontal & Vertical axis wind Mills, Wind Energy: Wind energy potential measurement, general theories of wind machines, basic laws and concepts of aerodynamics, wind mill and wind electric generator. Basic electric generation schemes- constant speed constant frequency, variable speed constant frequency and variable speed variable frequency schemes. Applications of wind energy.

UNIT IV

BIOMASS ENERGY: Introduction to biomass, biofuels & their heat content, biomass conversion technologies. Aerobic & anaerobic digester, Factors affecting biogas production, biogas plants - types & description. Utilisation of biogas - Gasifiers, direct thermal application of Gasifiers. Advantages & problems in development of Gasifiers, use in I.C. engines, Energy plantation. Pyrolysis scheme. Alternative liquid fuels –ethanol and methanol. Ethanol production.

Text Books:

1. Electric Power Generation, B.R. Gupta.
2. Power Generation, Operation and Control, Wood and Wollenberg, John Wiley & Sons, 1984.
3. Power Plant Engg: G.D. Rai.

Reference Books:

1. Renewable Energy Resources: John Twidell and Tony Weir.
2. Renewable Energy Resources Conventional & Non- Conventional: M.V.R Koteswara Rao.
3. Science & Technology of Photovoltaics: Jayarama Reddy P.

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

BT401B

BIOINFORMATICS

B. Tech Semester –VII (Open Elective)

L T P Credits
4 - - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

Approved by UG BOS & FET

UNIT I

INTRODUCTION: Internet, intranet and extranet, networking, protocols, genomic data, organization, representation, data base management systems.

SEQUENCING DATA BANK: Introduction, collecting and storing sequence in laboratory, Nucleic acid data bank – Gen Bank, EMBL, AIDS and RNA, protein data bank (PDB), Cambridge Structural Database CSD, genome data bank, hybridoma data bank structure and others.

UNIT II

SEQUENCE ANALYSIS: Analysis tools for sequence data banks, Pair wise alignment: NEEDLEMAN and WUNSCH algorithms, Smith Waterman, Multiple alignment – CLUSTAL-W, BLAST, FASTA, sequence patterns and motifs and profiles.

PREDICTIONS: Secondary and tertiary structure: algorithms Chao-Fasman algorithm, hidden Markov model, neural networking, protein classification, fold libraries, fold recognition (threading), homology detection, SRS-access to biological data banks.

UNIT III

PHYLOGENETIC ANALYSIS: Basic concepts in systematics, taxonomy and phylogeny, phylogenetic trees- various types and their construction, tree building methods, distance methods, multiple alignment character based method, phylogenetic software.

MANAGING SCIENTIFIC DATA: Introduction, challenges faced in integration of biological information, SRS, Kleisli Query System TAMBIS, P/FDM mediator for a bioinformatics database, federation, discovery link and data management.

UNIT IV

GENOMICS & PROTEOMICS: Genome mapping, assembly and comparison, functional genomics: sequence based approaches & microarray based approaches, proteomics: technology of protein expression analysis & posttranslational modifications, protein sorting, protein-protein interaction.

Text & Reference Books:

1. Developing Bioinformatics Computer Skill, ed. Gibes & Jombeck, Shroff Publication.
2. Bioinformatics, ed. David W. Mount

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

AE417B

MODERN VEHICLE TECHNOLOGY

B. Tech Semester –VII (Open Elective)

L T P Credits
4 - - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

Approved by UG BOS & FET

UNIT I

TRENDS IN POWER PLANTS: Hybrid vehicles – stratified charged / lean burn engines – Hydrogen engines – battery vehicles – Electric propulsion with cables – magnetic track vehicles.

UNIT II

SUSPENSION BRAKES AND SAFETY: Air suspension – Closed loop suspension – antiskid braking system, Retarders, Regenerative braking safety cage – air bags – crash resistance – passenger comfort.

UNIT III

NOISE & POLLUTION: Reduction of noise – Internal & external pollution control through alternate fuels / power plants – Catalytic converters and filters for particulate emission.

UNIT IV

VEHICLE OPERATION AND CONTROL: Computer control for pollution and noise control and for fuel economy – Transducers and actuators – Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.

VEHICLE AUTOMATED TRACKS: Preparation and maintenance of proper road network – National highway network with automated roads and vehicles – Satellite control of vehicle operation for safe and fast travel.

Text Books:

1. Heinz Heisler, "Advanced Vehicle Technology" - Arnold Publication.

Reference Books:

1. Beranek.L.L., Noise reduction, McGraw Hill Book Co., Inc., Newyork, 1993.
2. Bosch Hand Book, 3rd Edition, SAE, 1993.

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

CE451B

POLLUTION & CONTROL

B. Tech Semester –VII (Open Elective)

L T P Credits
4 - - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Duration of Exam. : 3 Hrs.

Approved by UG BOS & FET

UNIT I

WATER POLLUTION: Classification of water pollutants, water characteristics, effluent standards, primary treatment, secondary treatment – aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

UNIT II

AIR POLLUTION: Classification of air pollutants, Particulates: Physical characteristics, mode of formation, setting properties, Control measures.

HYDROCARBONS: Nature; sources, control, Carbon Monoxide: Source, harmful effects on human health, control measures. Oxides of Sulphur and Nitrogen Sources, effects on human health and plants. Control measure.

UNIT III

SOLID WASTE: Types, sources and properties of solid waste, methods of solid waste treatment and disposal.

SOLID WASTE MANAGEMENT: Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

UNIT IV

Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control.

TRACE ELEMENT: Mechanism of distribution, essential and non essential elements, trace of element in marine environment, its ecological effects and biological effects.

Text & Reference Books:

1. Environmental Engg.: by Howard s. Peavy & Others, MGH International.
2. Metacaf – EDDY – Waste-water engineering revised by George Teholonobus (TMH)
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K.DE, Wiley Eastern.
5. Air Pollution: H.C. Perking – Mc Graw Hill.

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

CSE411B

MANAGEMENT INFORMATION SYSTEM

B. Tech Semester –VII (Open Elective)

L	T	P	Credits
4	-	-	4

Class Work	:	25 Marks
Theory	:	75 Marks
Total	:	100 Marks

Approved by UG BOS & FET

Duration of Exam. : 3 Hrs.

UNIT I

INFORMATION SYSTEM: Introduction to Information System and MIS, Decision support and decision making systems, systems approach, the systems view of business, Managing the digital firm, Electronic Commerce and Electronic business, DBMS, RDBMS , introduction to Telecommunication and Networks.

I.T.INFRASTRUCTURE: Managing Hardware Assets, Managing Software Assets, Managing Data Resources. Internet and New I.T. Infrastructure.

UNIT II

CREATING ENTREPRENEURIAL VENTURE: Business Planning Process, Environmental Analysis - Search and Scanning, Identifying problems and opportunities, Defining Business Idea, Basic Government Procedures to be complied with.

UNIT III

DETAILED SYSTEM DESIGN: Inform and involve the organization, aim of detailed design, project management of MIS detailed design , identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inform and involve the organization again, inputs outputs and processing, early system testing, software, hardware and tools propose an organization to operate the system, documentation of detailed design.

UNIT IV

IMPLEMENTATION, EVALUATION AND MAINTENANCE OF THE MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files test the system, cut-over, document the system, evaluate the MIS control and maintain the system. Pitfalls in MIS development, Redesigning the organization with Information systems, Managing Knowledge Work.

Text Books:

1. Management Information System by W. S. Jawadekar, 2002, Tata McGraw Hill.
2. Management Information System by K.C. Laudon & J.P. Laudon 7th Edition 2003 Pearson Education Publishers Indian Reprint.
3. Information System for Modern Management (3rd edition)- Robert G. Murdick, Loel E. Ross & James R. Claggett. PHI.

Reference Books:

1. Management Information System; O Brian; TMH
2. Management Information System by Davis Olson Mac Graw Hill
3. Management Information System by Stallings,(Maxwell Mc Millman Publishers)

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

IT413B

CYBER SECURITY

B. Tech Semester –VII (Open Elective)

L T P Credits
4 - - 4

Class Work : 25 Marks
Theory : 75 Marks
Total : 100 Marks

Approved by UG BOS & FET

Duration of Exam. : 3 Hrs.

UNIT I

INTRODUCTION TO CYBERCRIME: Cybercrime and Information Security, Classifications of Cybercrimes, The need for Cyberlaws, The Indian IT Act Challenges to Indian Law and Cybercrime Scenario in India, Weakness in Information Technology Act and its consequences, Digital Signatures and the Indian IT Act, Cybercrime and Punishment; Technology, Students and Cyberlaw; Survival tactics for the Netizens, Cyber-offenses: Cyberstalking, Cybercafe and Cybercrimes, Botnets, Attack Vector, Cloud Computing.

TOOLS AND METHODS USED IN CYBERCRIME: Proxy Servers and Anonymizers, Phishing and identity theft, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow; Cybercrime: Mobile and Wireless Devices: Trends in Mobility, Attacks on Wireless Networks, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones.

UNIT II

UNDERSTANDING COMPUTER FORENSICS: The Need for Computer Forensics, Cyberforensics and Digital Evidence, Forensics Analysis of E-Mail, Digital Forensics Life Cycle, Chain of Custody Concept, Network Forensics, Computer Forensics and Steganography, Relevance of the OSI 7 Layer Model to Computer Forensics, Forensics and Social Networking Sites: The Security/Privacy Threats, Challenges in Computer Forensics, Forensics Auditing, Antiforensics.

UNIT III

ENTREPRENEURSHIP DEVELOPMENT AND GOVERNMENT: Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available; Role of Central/State agencies in the Entrepreneurship Development - District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB).

UNIT IV

CYBERSECURITY: ORGANIZATIONAL IMPLICATIONS: Cost of Cybercrimes and IPR Issues, Web Threats for Organizations, Security and Privacy Implications from Cloud Computing, Social Media Marketing, Social Computing and the Associated Challenges for Organizations, Protecting People's Privacy in the Organization, Organizational Guidelines for Internet Usage, Safe Computing Guidelines and Computer Usage Policy, Incident Handling, Forensics Best Practices, Media and Asset Protection, Importance of Endpoint Security in Organizations.

Text Books:

1. "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Nina Godbole, Sunit Belapur, Wiley India Publications, April, 2011.

NOTE:

In the Semester examination, the examiner will set 08 questions in all selecting two from each unit. The candidates will be required to attempt five questions in all, atleast one from each unit. All questions carry equal marks.

Approved by UG BOS & FET