Gondwana University, Gadchiroli

Board of Studies in

Electronics Engineering

Choice Based Credit System

III/IV/V/VI Semesters Syllabus

,

GONDWANA UNIVERSITY , GADCHIROLI

FACULTY OF SCIENCE & TECHNOLOGY

CONSOLIDATED STATEMENT OF VARIOUS PARAMETERS IN TEACHING & EXAMINATION SCHEME OF

B.E. (ELECTRONICS ENGINEERING)

SR. NO.	SEMESTER	NO. OF THEORY SUBJECTS	NO OF LABS/PRACT	TEACHING HOURS(TH) (L+T)	TEACHING HOURS (PRACT)	TOTAL CREDIT	MAX. THEORY MARKS	MAX.PRACT MARKS	MAX. MARKS TOTAL
1	I								
2	II								
3	III	5	3	19	6	22	500	150	650
4	IV	5	4	20	8	24	500	200	700
5	V	5	4	18	8	23	500	200	700
6	VI	5	3	20	6	23	500	150	650
7	VII	5	3	20	8	23	500	150	650
8	VIII	5	3	19	12	23	500	250	750
		30	**20**	**116**	**48**	**138**	**3000**	**1100**	**4100**

***Audit course. It is neither considered as passing head nor considered for earning some credit(s). However, this is mandatory to be taken up at the respective college level**

Subject wise Board of Studies Affiliation

Board of Studies	**Subject Codes**
APPLIED SCIENCES & HUMANITIES	BEEN 301,BEEN 401,BEEN 505
ELECTRICAL ENGINEERING	BEEN 303,BEEN 405,BEEN 503,BEEN 603
COMPUTER TECHNOLOGY/CSE	BEEN604
ELECTRONICS ENGINEERING	Rest all ,except above enlisted
EN/ETC/ECE COMMOMN	BEET302/BEEN302, BEET305/BEEN305,BEET 403/BEEN403,BEET405/BEEN404 BEET501/BEEN501,BEET502/BEEN502, BEET601/BEEN601,BEET602/BEEN602

A

Appendix A

Gondwana University, Gadchiroli

Four Year Degree Course in Engineering and Technology
Course and Examination Scheme with Choice Based Credit System
Third Semester B.E. (Electronics Engineering)

Subject Code	Subject	Teaching Scheme				Examination Scheme									
		Hours Per Week			Number of Credits	THEORY						PRACTICAL			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	Max. Marks Sessional		Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min. Passing Marks
								MSE	IE						
3BEEN01	Applied Mathematics-III	4	0	0	4	3	80	10	10	100	40	--	--	--	--
3BEEN02	Electronic Devices & Circuits	3	1	0	4	3	80	10	10	100	40	--	--	--	--
3BEEN03	Network Theory	3	0	0	3	3	80	10	10	100	40	--	--	--	--
3BEEN04	Programming Language C ++	3	1	0	4	3	80	10	10	100	40	--	--	--	--
3BEEN05	Electronic Measurements & Instrumentation	3	1	0	4	3	80	10	10	100	40	--	--	--	--
Laboratories															
3BEEN06	Electronic Devices & Circuits	0	0	2	1	--	--	--	--	--	--	25	25	50	25
3BEEN07	Programming Language C ++	0	0	2	1	--	--	--	--	--	--	25	25	50	25
3BEEN08	Electronic Measurements & Instrumentation	0	0	2	1	--	--	--	--	--	--	25	25	50	25
Total		**16**	**3**	**6**											
Semester Total		**25**			**22**					**500**				**150**	**650**

Appendix A

Gondwana University, Gadchiroli

Four Year Degree Course in Engineering and Technology
Course and Examination Scheme with Choice Based Credit System
Fourth Semester B.E. (Electronics Engineering)

Subject Code	Subject	Teaching Scheme				Examination Scheme									
		Hours Per Week			Number of Credits	THEORY						PRACTICAL			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	Max. Marks Sessional		Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min. Passing Marks
								MSE	IE						
4BEEN01	Applied Mathematics-IV	4	0	0	4	3	80	10	10	100	40	--	--	--	--
4BEEN02	Digital Circuits & Fundamentals of Microprocessors	3	1	0	4	3	80	10	10	100	40	--	--	--	--
4BEEN03	Electromagnetic Fields	3	1	0	4	3	80	10	10	100	40	--	--	--	--
4BEEN04	Electronic Engineering Materials & Components	3	1	0	4	3	80	10	10	100	40	--	--	--	--
4BEEN05	Basic Electrical Machines	3	1	0	4	3	80	10	10	100	40	--	--	--	--
Laboratories															
4BEEN06	Digital Circuits & Fundamentals of Microprocessors	0	0	2	1	--	--	--	--	--	--	25	25	50	25
4BEEN07	Basic Electrical Machines	0	0	2	1	--	--	--	--	--	--	25	25	50	25
4BEEN08	Programming Practice (MATLAB/SCILAB)	0	0	2	1	--	--	--	--	--	--	25	25	50	25
4BEEN09	Personal Proficiency-I	0	0	2	1	--	--	--	--	--	--	50	--	50	25
Total		**16**	**4**	**8**											
Semester Total		**28**			**24**					**500**				**200**	**700**

Appendix A

Gondwana University, Gadchiroli

Four Year Degree Course in Engineering and Technology
Course and Examination Scheme with Choice Based Credit System
Fifth Semester B.E. (Electronics Engineering)

Subject Code	Subject	Teaching Scheme				Examination Scheme									
		Hours Per Week			Number of Credits	THEORY						PRACTICAL			
								Max. Marks Sessional							
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	MSE	IE	Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min . Passing Marks
5BEEN 01	Linear Integrated Circuit	3	1	0	3	3	80	10	10	100	40	--	--	--	--
5BEEN502	Signals & Systems	3	1	0	3	3	80	10	10	100	40	--	--	--	--
5BEEN503	Power Electronics	3	0	0	3	3	80	10	10	100	40	--	--	--	--
5BEEN504	Advanced Microprocessors & Interfacing	3	1	0	3	3	80	10	10	100	40	--	--	--	--
5BEEN505	**Program Electives– I #**	3	0	0	3	3	80	10	10	100	40	--	--	--	--
Laboratories															
5BEEN506	Linear Integrated Circuits	0	0	2	2	--	--	--	--	--	--	25	25	50	25
5BEEN507	Advanced Microprocessors & Interfacing	0	0	2	2	--	--	--	--	--	--	25	25	50	25
5BEEN508	Power Electronics	0	0	2	2	--	--	--	--	--	--	25	25	50	25
5BEEN509	Minor Project and Seminar	0	0	2	2	--	--	--	--	--	--	50	--	50	25
Total		**15**	**3**	**8**											
Semester Total		**26**			**23**					**500**				**200**	**700**

1.TheoryofCommunication Engineering 2.Electronic System design3. Switching Theory and Automata

 # Industrial Training /Internship/Case Studies:- It is to be completed during the summer vacation after completion of fourth semester and/or winter vacation after the completion of Fifth semester and its planning and allocation should be done during the fourth/ fifth semester and its marks will be awarded in the sixth semester for subject code 6BEEN08 on submission of the certified relevant report at the end of sixth semester.

Appendix A

Gondwana University, Gadchiroli

Four Year Degree Course in Engineering and Technology
Course and Examination Scheme with Choice Based Credit System
Sixth Semester B.E. (Electronics Engineering)

Subject Code	Subject	Teaching Scheme				Examination Scheme									
		Hours Per Week			Number of Credits	THEORY						PRACTICAL			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	Max. Marks Sessional		Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min. Passing Marks
								MSE	IE						
6BEEN 601	Principles of Communication Engineering	3	1	0	3	3	80	10	10	100	40	--	--	--	--
6BEEN 602	Fields & Radiating Systems	3	1	0	4	3	80	10	10	100	40	--	--	--	--
6BEEN 603	Control System Engineering	3	1	0	4	3	80	10	10	100	40	--	--	--	--
6BEEN604	Microcontrollers & Its Applications	3	1	0	3	3	80	10	10	100	40	--	--	--	--
6BEEN 605	**Program Electives– II #**	3	1	0	3	3	80	10	10	100	40	--	--	--	--
Laboratories															
6BEEN 606	Principles of communication Engineering	0	0	2	2	--	--	--	--	--	--	25	25	50	25
6BEEN 607	Microcontrollers & its Applications	0	0	2	2	--	--	--	--	--	--	25	25	50	25
6BEEN608	**# Industrial Training /Internship/Case Studies**	0	0	2	2	--	--	--	--	--	--	50		50	25
Total		**15**	**5**	**6**											
Semester Total		**26**			**23**					**500**				**150**	**650**

ELECTIVE-II # 1. Computer Architecture and Organization. 2. Digital Communication 3. Mechatronics

 # Industrial Training /Internship/Case Studies:- It is to be completed during the summer vacation after completion of fourth semester and/or winter vacation after the completion of Fifth semester and its planning and allocation should be done during the fourth/ fifth semester and its marks will be awarded in the sixth semester for subject code 6BEEN08 on submission of the certified relevant report at the end of sixth semester.

V Semester B.E.

Electronics Engineering

FIFTHSEMESTERBEELECTRONICS ENGINEERING

CourseCode:5BE**EN501**

Title of the Course :**LINEAR ELECTRONIC CIRCUITS**

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration Of paper, hrs	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	Contents	Hours
I.	Basic Operational Amplifier, Differential Amplifier Stages, Current Source Biasing, Level Shifting Techniques, Common Mode and Differential Mode Gains, Frequency Response and Compensation.	10
II.	Characteristics of Ideal And Non Ideal OpAmp, Error Measurement of Various Parameters, LinearApplicationLikeInverting, NonInverting.Integrator, Differentiator, Differential Amp, Bridge Amplifier, Voltage to Current Converter, Regulators.	12
III.	Non-Linear Application Like Limiters, Precision Rectifier, Log Amplifier, Antilog Amplifier, Multiplier, Divider, As table, Mono stable, Comparator, Schmitt Trigger, Square to triangular Wave Generator.	
IV.	Design of Active filter. 1 and 2 order butter worth filter, Sinusoidal Oscillators D/A and A/D Conversion Circuits, Sample Hold Circuits.	08
V.	Application of ICs Like LM741, LM 555 Timer ICs, Phase Locked Loop, LM 566(VCO), LM339(Comparator), LM723(Voltage Regulator),Regulator IC Series 78xx, 79xx.	12

Reference Books :

1. R. A. Gaikwad, “Op Amps and Linear Integrated Circuits”, PHI Publication, 4th Edition
2. D. Roy Choudhary, Shail Jain, “Linear Integrated Circuits”, New Age International
3. U. A. Bakshi, A. P. Godse, “Linear Integrated Circuits & Application”, Technical Publication Pune
4. K. R. Botkar, “Integrated Circuits”, Hanna Publication 9th Edition
5. Coughlin, Driscoll, “Operational Amplifiers and Linear Integrated Circuits”, PHIPublication4thEdition

FIFTH SEMESTER B.E. ELECTRONICS AND COMMUNICATION ENGINEERING/ ELECTRONICSAND TELECOMMUNICATION ENGINEERING

Course Code : 5BEEN02

Title of the Course : **SIGNALS AND SYSTEMS**

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

COURSE OBJECTIVES:

The aim of the course is for:

1. Understanding the fundamental characteristics of signals and systems.
2. Understanding signals and systems in terms of both the time and transform domains,
3. taking advantage of the complementary insights and tools that these different perspectives provide.
4. Development of the mathematical skills to solve problems involving convolution, filtering and modulation.

Unit	Contents	Hours
I	**INTRODUCTION TO SIGNALS AND SYSTEMS**	
	Introduction, Continuous Time and Discrete Time signals, Elementary Signals: Unit Impulse, Unit Step, Ramp, Rectangular, Triangular, Signum, Sinc, Exponential and Sinusoidal, Transformation of Independent Variable: Time Shifting, Time Scaling and Time Reversal, Classification of Signals: Periodic and Aperiodic, Even and Odd, Energy and Power, Causal and Non causal. Systems: Definition, Classification: Linear and Non Linear, Time Variant and Invariant, Causal and Non-causal, Static and Dynamic, Stable and Unstable, Invertible and Non Invertible, Incrementally linear Systems.	10
II	**LINEAR TIME INVARIANT SYSTEMS**	
	Discrete-Time LTI Systems: The Convolution Sum, Continuous-Time LTI Systems: The Convolution Integral, Properties of Linear Time-Invariant Systems: Invertibility, Causality, Stability, Unit step response of an LTI System, Causal LTI Systems Described by Differential and Difference Equations.	9
III	**FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS**	

	The Response of LTI Systems to Complex Exponentials, Fourier Series Representation of Continuous-TimePeriodic Signals, Convergence of the Fourier Series, Properties of Continuous-Time Fourier Series, Fourier Series Representation of Discrete-TimePeriodic Signal, Properties of Discrete-Time Fourier Series, Fourier Series and LTI Systems.	9
IV	**FOURIER TRANSFORM**	
	Representation of Aperiodic Signals: The Continuous-Time Fourier Transform, The Fourier Transform for Periodic Signals, Properties of the Continuous-Time Fourier Transform, The Discrete-Time Fourier Transform (DTFT), DTFT of Discrete Periodic Signals, Properties of the DTFT.	9
V	**THE LAPLACE TRANSFORM**	
	The Laplace Transform, The Region of Convergence for Laplace Transforms, The Inverse Laplace Transform, Geometric Evaluation of the Fourier Transform from the Pole-Zero Plot, Properties of the Laplace Transform, Laplace Transform Pairs, Analysis and Characterization of LTI Systems Using the Laplace Transform, The Unilateral Laplace Transform.	8

TEXT BOOKS:

1. "Signals and Systems" by Alan V. Oppenheim, Alan S. Wilsky and S. Hamid Nawab, Publication: Prentice Hall of I ndia.
2. "Signals and Systems" by P. Ramesh Babu, R. Ananda Natarajan, SciTech Publications (India).

REFERENCE BOOKS:

1. "Signals and Linear Systems" by Gabel R.A. and Robert R.A, John Wiley and Sons, New York.
2. "Systems and Signal Analysis" by C. T. Chen Publication: Oxford University Press, India.
3. "Introduction to Signals and Systems" by Michael J. Robert, Publication: Tata Mc-Graw Hill.
4. "Signals and Systems" by S. Haykin and B. V. Veen, Publications: Joh n Wiley and Sons, Inc.
5. "Signals and Systems Analysis using, Transform Methods and MATLAB " by M. J. Roberts Tata McGraw-Hill Publishing Company Limited.

Course Outcome

At the end of the course Students will be able to –

CO1 Analyse different types of signals & Systems.
CO2 Determine the response of LTI system using convolution.
CO3 Assess the spectral characteristics of periodic and aperiodic signals.
CO4 Inspect system properties based on impulse response.
CO5 Prove the properties of various transforms

CourseCode :**EN503**

Course Code: 5BEEN 03

Title of the Course :**POWER ELECTRONICS**

FIFTH SEMESTER B.E. (Electronics /Electronics& ele) Communication/Instrumentation)

SUBJECT : POWER ELECTRONICS

Lectures	Tutorial(s)	Practical	Total periods/week (each of 60 minutes)	Credits
03	01	02	07	0

Unit	Contents	Hours
I	**Basic sin Power Electronics Engineering** Development of Power Controllers, Working Principle & Characteristics of different Power Controllers, Thyristor Family, Two Transistor model of SCR, Gate Characteristic, Turn On ,Turn Off Mechanisms & other ratings of SCRs, Relaxation Oscillator susing UJT, Basic Firing Circuits for SCR, Application of SCR in obtaining Logic Gates, FlipFlop and Circuit Breaker, AC Power control using TRIAC-DIAC, Basic Firing Circuits for SCR Power Transistor, Power MOSFET & IGBT (Basic properties, characteristics, comparison & applications)	12
II	**Phase Controlled Rectification** Principle of Phase Control, Line Commutation, Single phase half wave, Full wave mid–point, Fullycontrolledwith&withoutfreewheelingdiodewithdifferenttypesofLoads,Effectof Source inductance, Half Controlled Bridge configurations, Development of expressions for mean current & voltage for different loads, Dual Converter Three Phase fully controlled& half controlled bridge circuits, Development of expressions form ean voltage	10
III	**Inverters** PrincipleofInversion,VariousTechniquesofForcedCommutation&theirdesigns,Singlephase & Three phase series Inverter, Single Phase Parallel Inverter, Single phase bridge Inverter (All with commutation Circuits), Design of Filter Three phase fully controlled bridge inverters in different modes (without commutation Circuit), Design of complete firing circuit for Three phase Power Control Circuits	12

IV	**Choppers & Cyclo converter** Principle of Working, Types of Choppers, Oscillating Chopper, Jones & Morgan"s Chopper, Multiphase Chopper, Step-up Chopper, AC Chopper, Need&PrincipleofWorkingofCycloconverterusingsinglephasebridgecircuits	08
V	**Multiple Connection& Protection** Need&methodsofmultipleconnectionsofSCRs,DesignofEqualizingCircuits,FiringCircuits duringmultipleconnection,Gateprotection,Overcurrent&overvoltageprotectionsofSCR, Design of Snubber Circuit, Converter Faults	08
	Total	**50**

TextBooks:

(1) M.H.Rashid,"PowerElectronicsCircuits,Devives&Applications",PearsonEducation
(2) C.W. Lander, "Power Electronics", McGrawHill
(3) M. Ramamoorthy, "Thyristors & their Applications"
(4) GKDubey,Doradla,Singh,Joshi"ThyristorstorizedPowerControllers",NewAgeInternational
(5) Singh, Khanchandani,"Power Electronics",Tata McGrawHill
(6) SCR Manaual by General Electric

Reference Books:

(1) PhilipT.Krein,"Elements of Power Electronics", Oxford University Press
(2) VedamSubrahmanyam,"PowerElectronics",NewAgeInternational
(3) MSJamilAsghar,"PowerElectronics",PrenticeHallofIndia
(4) PCSen,,ModernPowerElectronics",S.ChandPublishers
(5) PSBhimra,"PowerElectronics",KhannaPublishers

Title of the Course : **ADVANCED MICROPROCESSOR ANDINTERFACING** **Course Code: 5BEEN 04**	

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration Of paper, hrs	MSE	IE	ESE	Total
3	**1**		**4**	**4**	**3Hrs**	**10**	**10**	**80**	**100**

Unit	Contents	Hours
I	**Introductionto16-bitMicroprocessor8086**:	
	Architecture of 16bit Microprocessor8086,conceptofpipeliningandmemorysegmentation ,logicaladdress,offsetaddressandphysicaladdress,BusInterfaceUnit(BIU),ExecutionUnit(EU), segment registers, Pin functions, Minimum and Maximum mode of operation, addressing modes,, assembler directives,.	12
II	**Instruction set, Interrupt sand Memory Interfacing:**	
	Instruction set, Assembly Language programming,Stackstructureof8086,Interruptsand Interrupt servicer outines, processing finterrupt, Internal and External interrupts, Interrupt Priorities, Memory Interfacing Concepts, Interfacing of 8086 Microprocessor with memory ICs.	8
III	**PIO8255[Programmable Input-Output Port]**	
	ProgrammablePeripheralInterface8255, architecture, signal descriptions and operational modes. Interfacing of 8255 with 8086, Interfacing of ADC & DAC, Stepper motor interfacing; Programmable Interval Timer 8254: Architecture and Signal Descriptions, Operating Modes, Programming and Interfacing.	10
IV	**Programmable Peripheral Devices and Their Interfacing**	
	ProgrammableInterruptController8259:ArchitectureandSignalDescriptions.Command Words and Modes of Operations. Programming and Interfacing; Keyboard /Display Controller 8279: Architecture and Signal Descriptions ,Modes of operations, Programming and Interfacing.	10
V	**DMA controller & Serial Communication: Interfacing and Programming**	

Architecture of 8257DMA Controller, Interfacing of 8257 with 8086, brief programming. Architecture and operationof8251 USART, interfacingwith8086, brief programming. RS232 10
Serial Communication Standards.

2. Microprocessors: The 8086/8088, 80186/80286, 80386/80486 and the Pentium Family Bahadure, N. B.,-Prentice Hall of India Private Limited

Text Books:

1. Advanced Microprocessor and Peripherals-A. K. Ray and K.M. Bhurchandi, Tata McGraw Hill.
2. Microcomputersystems8086/8088family, Architecture, Programming and Design-Yu-Cheng Liu & Glenn AGibson, 2ndEdition-July2003, Prentice Hall of India
3. The 8086 Family:Design, Programming Interfacing,--John Uffenbeck, Prentice Hall of India

Reference Books :

1. Microprocessor and Interfacing, Programming& Hardware-Douglas V Hall, 2nd Edition, Tata McGraw Hill.

(ELECTIVE I)

Title of the Course : **THEORY OFCOMMUNICATION ENGINEERING**

Course Code :5BEEN 05

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration Of paper,	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	C	Hours
I	**MODULATIONTECHNIQUES**	
	Amplitudemodulation,AM-DSB,SSB,SSB-SC,DemodulationofAMsignals,Vestigialsidebandtransmission, Frequency modulation, Demo dulation of FM signals, Frequency division multiplexing, Time division multiplexing.	10
II	**ENERGY&POWERDENSITYSPECTRAOFANALOGANDDIGITALSIGNALS**	
	Signaltransmissionthroughlinearsystems,Filtercharacteristicsoflinearsystems,Distortionlesstransmission,IdealandPracticalfilters,Energyand power densityspectrum,Linecoding,Manchestercoding,Polarcoding,Bi-polarcoding,NRZcoding,RZ coding,PSD of digital signals,ControlofPSDbypulseshaping,Nyquistfirstandsecondcriteria.	10
III	**PROBABILITYANDRANDOMPROCESS**	
	Probability, Conditional Probability, Random Variables, Cumulative Distribution function, Probability Density Function & its properties, Statistical AveragesofRandomVariables , UniformDistribution, GaussianorNormalDistribution, Introductiontorandomprocess.	10
IV	**PULSECOMMUNICATION**	
	Pulsemodulation,PAM,PCM,DPCM,Deltamodulation,Adaptivedeltamodulation,Matchedfilterdetectionofbinarysignals,Optimumreceiver, Decision thres hold, Error probability, ASK, FSK & PSK systems, DPSK systems, M-ary communication systems.	10
V	**INFORMATIONTHEORY**	
	Average information, Informationmeasure,Entropy,Channelcapacityofdiscrete&continuouschannel,Shannon"stheorem,Hammingcodes,Huffman coding, Linear block codes, Cyclic codes, Convolution codes, Trellis diagram.	10

Text Books:

1. Modern Analog & digital Communications, B.P.Lathi
2. Communication Systems: Simon Haykins

Reference Books :

1. Communication System:B.P. Lathi
2. Communication System:A.B. Carlson

Title of the Course :ELECTRONIC SYSTEM DESIGN (ELECTIVE I)

Course Code:5BEEN 05

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration Of paper,	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	C	Hours
I	Design of Power supply system: Unregulated D.C. power supply system with rectifiers and filters. Design of emitter follower	10
II	Design of class A small signal amplifiers: Emitter follower, Darlington pair amplifiers with and without Bootstrapping, Two stage direct coupled amplifier	10
III	Design of class A, Class B, Class AB audio power amplifier with drivers.	10
IV	Design of sinusoidal oscillators: OPAMP based Wein bridge and Phase Shift oscillators with AGC circuits, Transistor based Hartley, Colpits and Crystal oscillators, Evaluation of figure of merit for all above oscillator circuits.	10
V	Design of constant current sources, Design of function generators, Design of tuned amplifiers. Design of Butterworth, Chebyshev filters upto sixth order with VCVS and IGMF configuration.	10

BOOKS :

1.Regulated Power supply Handbook. Texas Instruments.

2.Electronics : BJT's, FETS and Microcircuits – Anielo.

3.Monograph on Electronic circuit Design : Goyal&Khetan

Title of the Course : SWITCHING THEORY AND AUTOMOTA (ELECTIVE I)
Course Code:5BEEN 05.

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration ofpaper, hrs	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	C	Hours
I	Switching algebra and Minimization of switching functions Switching algebra and functions, Boolean algebra, Boolean functions, K-Map for 6 variables, Minimization of Booleans function using tabulation method, relation and lattices, Venn diagram, sets theory.	10
II	Functional decomposition and symmetric functions Design of combinational logic circuits, contact networks, functional decomposition and symmetric functions	10
III	Threshold logic, threshold elements, capabilities and limitations of threshold logic, elementary properties, unate functions, synthesis of threshold functions, cascading of threshold elements.	10
IV	Finite state machine-Moore and Mealy synchronous sequential circuits, Design capabilities, Minimization and transformation of sequential machine, Sequence detector, Design of fundamental mode and pulse mode circuits	10
V	Structure of sequential machine, lattice of closed partitions, state assignment using partitions, Reduction of output dependency, Input Independence and autonomous clock, homing sequence, synchronizing sequence, Adaptive Distinguishing experiments	10

BOOKS:

Textbooks:

1.Kohavi ZVI,'
Switching and Finite Automata Theory', 2nd Edition, TMH
2.Modern switching theory by S.C.lee

Reference Books:

1.M.MorrisMano,'Digital Design', 3rd Edition, Pearson Education.
2.Donald D.Givone,'Digital principles and Design', TMH.
3.Anand Kumar,' Fundamentals of Digital Circuits' PHI.
4.RP Jain 'Modern Digital Electronics', 2nd Edition, TMH
5.Switching Theory & Logic Design by CVS Rao
6.FUNDAMENTALS OF SWITCHING THEORY AND LOGIC DESIGN, JAAKKO T. ASTOLA

FIFTHSEMESTERBEELECTRONICS ENGINEERING

CourseCode :EN506

Title of the Course

Title of the Course : **LINEAR ELECTRONIC CIRCUITS**
Course Code: 5BEEN 06

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	2	2	**2**	**25**	**25**	**50**

50 %ofthe experiments are based on ORCAD oranyEquivalentsimulation software.

List of suggested practicals
1. To Study elementary circuit using Op-amp (Inverting, Non Inverting amplifiers, voltage follower, Integrator and Differentiator) 2. To study square and triangular wave generating circuits. 3. To study Op-Amp parameters-I (Input impedance, output impedance, slew rate, frequency response) 4. To study Op-Amp parameters-II (Input off set voltage, Input off setcurrent, Inputbias current, CMRR) 5. To study instrumentation amplifier. 6. To study logamplifier 7. To study weinbridgeoscillator 8. To study Op-Amp as low pass filter. 9. To study Op-Amp ashigh pass filter. 10. To study IC555 timer.

Course Code: 5BEEN 07

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	2	2	**2**	**25**	**25**	**50**

List of suggested practical's

1. Write8086Assembly language program (ALP) toad array of Nhexadecimal numbers stored in the memory. Accept input from the user.

2.Write 8086 ALP toper form non-over lapped and over lapped block transfer (with and with out string specific instructions).Block containing data can be defined in the data segment.

3.Write 8086 ALP toconvert4-digit Hexnumberintoits equivalent BCD number and 4-digit BCD number into its equivalent HEX number.

4. Write 8086 ALP for the following operations on the string entered by the user.

a) Calculate Length of the string b)Reverse the string

6. Write 8086 ALP toper form multiplication of two 8-bithexadecimalnumbers.Use successive addition and add and shift method. Accept input from the user.

7. Interfacing and programming: 8255 with 8086, I/Otransfer and use of different ports

8. Interfacing and programming: ADC/DAC with 8086

8. Interfacing and programming: 8254 with 8086, use of different timer modes.

9. Interfacing and programming: 8259 with 8086

10. Interfacing and programming of different peripherals: 8279,8257,8251

VSEMESTERB.E. ELECTRRONICS ENGINEERING

Title of the Course : POWER ELECTRONICS

Course Code :5BEEN08

LABORATORY Common for B. E.

Electronics/Electrical/Instrumentation Engineering

Course Scheme				Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Credits	TW	POE	Total
0	0	2	2	25	25	50

Course Objectives:

1. To become familiarizeandex plain the physical principles, operations, structural detail sand their characteristics of power semi conductorr devices.
2. To understand the variouste chniques of turning on & turning off of the thyristors.
3. To describe the operation of different rectifiers, cyclo converters, inverters and choppers with their applications.

Suggested list of Experiments:

1) To study I-V characteristics of SCR.
2) To study I-V characteristics of DIAC.
3) To study I-V characteristics of TRIAC.
4) Phase control of TRIA Cussing DIAC.
5) To study R firing, RC firing and UJT firing circuits.
6) To study oscillating chopper.
7) To study half controlled half wave bridge rectifier.
8) To study full controlled full wave bridge rectifier.
9) To study I-Characteristics of Power MOSFET.
10) To study I-V characteristics of IGBT.

FIFTH SEMESTER B.E. ELECTRONICS AND COMMUNICATION ENGINEERING/ ELECTRONICS AND TELECOMMUNICATION ENGINEERING

Course Code: **5BEEN09**

Title of the Course: **MINOR PROJECT & SEMINAR**

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**2**	**50**	**0**	**50**

Contents
After completing this Minor Project the student should be able to practice complete process of designing and making of PCB and Electronics circuit design 1. PCB Layout: Drawing PCB layout, standard rules, precautions, use of software like Eagle, ORCAD Layout for PCB layout 2. PCB manufacturing process: Mirror image of PCB layout, printing, exposing, itching, tanning of PCB 3. Fabrication of circuit on PCB: Mounting components, soldering, testing

A group of students (not more than five) should submit the Project Report based on Minor project

References:

1. PCB Design by Boshart, TMH publications.
2. Integrated Circuit Fabrication Technology by Elliot TMH publications. Manuals of ORCAD and Eagle

VI Semester

B.E. Electronics Engineering

SIXSITH SEMESTER BE ELECTRONICS ENGINEERING

Course Code :6BEEN01

Title of the Course : PRINCIPLES OF COMMUNICATIONENGINEERING

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
3	1	0	4	5	3	10	10	80	100

Units	Contents	Hours
1	**Wave propagation & Noise** Fundamentals of electromagnetic waves, Ground wave propagation, sky wave, space wave, and troposphere scatter. Electromagnetic frequency spectrum, communication systems, need of modulation and its types. Noise: Sources of noise and its types, signal to noise ratio, noise factor, noise figure, noise temperature, noise equivalent temperature.	10
2	**Amplitude Modulation :** Amplitude modulation (AM), double side band (DSB), double side band suppressed carrier (DSB-SC), single side band (SSB), vestigial side band modulation (VSB): generation, demodulation, Independent side band (ISB) transmission, modulation index, frequency spectrum. Power requirement of these Systems. AM transmitter (broadcast and low power), Noise in AM systems.	09
3	**Angle Modulation :** Generalized concept and features of angle modulation; Frequency modulation (FM): modulation index, power requirement, frequency spectrum, bandwidth, phasor comparison of narrowband FM and AM waves, Generation of FM, Demodulation of FM, interference in FM system, pre-emphasis and de-emphasis techniques, FM receiver, noise in FM receiver. Phase modulation (PM): modulation index, power requirement, frequency spectrum, bandwidth analysis of narrow band FM, wide band FM and PM, interference in angle modulated system, FM transmitter (broadcast and low power). Noise in FM systems	09
4	**Radio Reciever :** TRF and super-heterodyne receiver, AGC, FM receiver, sensitivity, selectivity, image frequency rejection measurements, communication receiver and its special features. Transceivers for wireless mobile communication devices. Types of antenna, radiation pattern, antenna arrays, turnstile, loop, log periodic, UHF and microwave antenna.	09
5	**Analog Pulse Modulation:** Sampling theorem, Pulse Amplitude Modulation (PAM), Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), generation & Detection of these pulse modulated signals, Pulse Code Modulation (PCM), Differential Pulse Code Modulation (DPCM), Delta Modulation (DM),AdaptiveDeltaModulation(ADM).TimeDivisionMultiplexing(TDM)&Frequency Division Multiplexing (FDM)..	08

Text Books:

1) “Electronic Communication Systems”, “Kennedy”, TMH

References:

1. Introduction to Analog & Digital Communication Systems”, “Haykin Simon”, JohnWile
2. “Modern Analog & Digital Communication Systems”, “Lathi B.P”, JohnWiley
3. “Communication Electronics Principles and Applications”, “Frenzel”, TMH, 3rd Edition

SIXTH SEMESTER BE ELECTRONICS ENGINEERING

Course Code : 6BE**EN 02**

Title of the Course : **FIELDS AND RADIATINGSYSTEMS**

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	Contents	Hours
I	**Transmission Lines:**	
	Basic Principles of Transmission lines, Line Equations, Transmission line parameters, characteristic impedance, propagation constant, attenuation constant and phase constant, reflection coefficient and VSWR, Introduction to Smith Chart And Stub matching.	10
II	**Guided waves and waveguide:**	
	Parallel planes Wave Guide: Field Equation, TE, TM, TEM waves and their characteristics, Attenuation in parallel plane guides, wave impedances. Rectangular waveguides: Field Equation, TM, TE waves in rectangular guides and their characteristics, wave velocity, guide wavelength, wave impedances.	10
III	**Radiation and Antenna:**	
	Scalar and vector potentials, Concept of retarded potentials, field due to a current elements, power radiated and radiation resistance for field due to a dipole, Antenna Parameters: radiation intensity, Directive gain , directivity , antenna gain ,Antenna Efficiency, Effective aperture of an antenna, Effective Length, reciprocity theorem applied to antennas.	8
IV	**Antenna Array:**	
	Various forms of Antenna Arrays: Broadside Array, End Fire Array, Array of Point Sources, Two element arrays and their directional characteristics, linear array analysis of broadside and end-fire arrays, pattern multiplication, binomial arrays, Dolph-Tchebyscheff Array.	9
V	**Practical Antenna:**	
	Parabolic reflectors, Lens antennas, Folded dipole, Turnstile Antenna, YagiUda antenna, Log-periodic antennas, Horn antennas, Traveling wave antennas, Cassegrain antenna.	8

Text Books:

1. Edward C. Jordan & Keith G. Balmain „„Electromagnetic waves and radiating systems", Prentice- Hall,2006
2. K. D. Prasad, „Antenna And Wave Propagation ", SatyaPrakashan

Reference Books:

1. John D. Kraus, „Electromagnetic", Tata Mcgraw Hill, Book Co. NewYork.
2. RajeshwariChatterjee,'AntennaTheoryandPractice',NewAgeInternational(P)Limited.

SIXTH SEMESTER BE ELECTRONICS ENGINEERING

Course Code :6 BEEN 03

Title of the Course : B.E. V- SEMESTER (ELECTRONICS/ E&TC) AND
B.E. VI : SEMESTER (ELECTRICAL/E&P/EEE)
SUBJECT : CONTROLSYSTEM

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	Contents	Hours
I	**Systems and their Representation** Basic elements in Control Systems, Open loop and Closed loop Systems, Electrical analogy of Mechanical and Thermal Systems, Transfer Function, Block diagram reduction technique, Signal flow graph, Effect of feedback on sensitivity to parameter variation and reduction of the noise.	10
II	**Time Response Analysis** Time response, Time domain specification, Types of test inputs, First and Second order system response, Error coefficient, Generalized error series , Steady State Error, P,PI,PID modes of feedback control.	10
III	**Stability of Control System** Stability of control system, location of roots in S plane for stability, characteristics equation, Routh-Hurwitz criterion, Special cases for determining relative stability, Root locus construction, Root location and its effect on time response, Effect of pole-zero addition on proximity of imaginary axis.	10
IV	**Frequency response methods** Frequency response of linear system, Logarithmic frequency response (Bode) plots from transfer function for various systems, Polar plots for various systems, Estimation of approximate transfer function from the frequency response, Stability analysis from Bode plots, Nyquist criterion, Nyquist Plots and stability analysis.	10
V	**State Space Analysis of Control System** State variable method of analysis, Characteristics of system state, Choice of state variables, representation of vector matrix differential equation, Standard form, relation between transfer function and state variable.	10
		50

Text Books :

1. Automatic Control Systems (with MATLAB Programs) by S.HasanSaeed, S.K.Kataria&Sons.
2. Control System Engineering by NagrathI.J.Gopal M, WileyEastern.
3. Modern Control Systems by Ogata K,Prentice Hall ofIndia.
4. Linear Control Systems by B.S.Manke, KhannaPublication.

Reference Books :

1. Analysis and Design of Control Systems using MATLAB by Rao.V.Dukkipati,NewAge.
2. Modern Control System by Richard Dorf,Robert Bishop, IIth edition2008.

VI SEMESTER B.E. ELECTRONICS ENGINEERING

Course Code: 6BEEN04

Title of the Course : MICROCONTROLLER AND ITS APPLICATIONS

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**3**	**3**	**10**	**10**	**80**	**100**

Units	Contents	Hours
1	Evolution of microcontrollers, The 8051 Microcontroller**:** Block diagram, programming model, pin diagram, flag register and PSW, memory organization, stack and stack pointer, special function registers	10
2	I/O ports, Interrupts, counters and timers, Serial data Input/output, external memory	08
3	Addressing modes, Instruction set: Data transfer, logical, arithmetic, branching, Assembly language programming	10
4	Interfacing: keyboard, LED and LCD, ADC/DAC, stepper motor interfacing,	09
5	AT89C51microcontroller: Pin diagram, Architecture, features of flash memory AT89C2051microcontroller: the baby 8051, pin diagram, architecture, flash memory	8
	Total	**45**

Text Books :

1. 8051 Microcontroller and Embedded Systems using Assembly and C by Keneth J. Ayala, Dhananjay V. GadreCengageLearning
2. The 8051 Microcontroller Hardware, Software and applications by V. Udayshankara, M. S. Mallukarjunswamy,Mcgraw -Hill
3. 8051 Microcontroller and Embedded Systems using Assembly and C by Muhammad Ali Mazidi, Janice GillispieMazidi and RolinD.MacKinlay, Pearson Education, Second Edition.

Reference Books :

1. Microprocessor and Microcontroller by R. Theagarajan, Sci Tech Publication,Chennai.
2. Architecture, Programming, Interfacing and System Design by Raj Kamal, PearsonEducation.

SIXTH SEMESTER BE ELECTRONICS ENGINEERING

Course Code : **6BEEN 05**
Title of the Course **: ELECTIVE II COMPUTER ARCHITECTURE ANDORGANIZATION**

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration of paper (hrs)	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	Contents	Hours
I	**Levels Of Design**	
	Basic structure and characteristics of computer hardware and software, functional units, basic operational concepts, bus structures, software. Component details, Combinational and sequential components, Description language, Design methods, Design components and design techniques.	9
II	**Processor Design**	
	The processing unit: some fundamental concepts, Computer peripherals : I/O devices. Architecture of CPU, Performance parameters, Instruction format, RISC, CISC, Addressing modes, Parallel processing, pipelining	8
III	**Micro-programmed Control**	
	Micro-programmed control: Microinstructions, grouping of control signals, micro program sequencing, micro instruction with next address field, perfecting microinstruction, emulation, introduction to microprogramming.	10
IV	**Number Format & Arithmetic Algorithms**	
	Floating point arithmetic, IEEE 754 floating point format, Single precision and double precision IEEE format, addition of positive numbers, addition and subtraction, arithmetic and branching conditions, multiplications of positive numbers, signed-operand multiplication, fast multiplication, restoring and non restoring division.	10
V	**Memory organization**	
	Basic concepts of memory, semiconductor RAM memories, memory system considerations, semiconductor ROM memories, multiple module memories and interleaving, locality of reference, cache memories, virtual memories, CAM, replacement policies.	8

Reference Books:

1. V. Carl Hamacher, “Computer Organization”, Tata McGraw Hill Inc, 5 thedition
2. William Stallings , “Computer Organization And Architecture”, PHI edition

SIXTH SEMESTER BE ELECTRONICS ENGINEERING

Course Code :**6BEEN 05**

Title of the Course **: ELECTIVE II DIGITAL COMMUNICATION**

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration of paper (hrs)	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	Contents	Hours
I	Digital Communication Concept Review of Random variables, PDFs & CDFs, Central limit Theorem. Model of digital communication system, Gram Schmitt Orthogonalization procedure, signal space concept, Geometric interpretation of signals, probability of error, correlation receiver, matched filter receiver.	
II	Source & Waveform Coding Methods Source coding Theorem, Huffman Coding, L-Z encoding algorithm, rate distortion theory for optimum quantization, scalar & vector quantization,. Waveform coding methods: ADPCM, Adaptive Sub -Band & Transform coding, LP & CELP coding.	
III	Digital Modulation Techniques Coherent Binary: QPSK, MSK, Gaussian MSK, DPSK, Memory less modulation methods, linear modulation with memory, nonlinear modulation methods with memory: CPFSK, CPM.	
IV	Channel Coding (PART -1) Introduction to Galois field, Construction of Galois field GF (2 m) & its basic properties. Types of error control: Forward error correction (FEC), Automatic repeat request system (ARQ). Convolution encoding and decoding distance properties, Viterbi algorithm and Fano algorithm.	
V	Channel Coding (PART -II) Trellis coded modulation, Introduction to Turbo coding, & Reed Solomon Codes: encoding & decoding, Low density parity check coding (LDPC	

Text Books:

1.Digital communication: John G Prokis (TMG)
2.Digital communication: Simon Haykin (WEP)

Reference Books:

1.Lathi B.P. -Modern Digital and Analog communications systems -PRISM Indian Ed.
2.Digital Communication: J.S.Chitode
3.Digital Communication (Fundamentals & applications): Bernard Scalr
4.Introduction to Error Control Codes: Salvatore Gravano
5.OFDM For wireless communication systems: Ramjee Prasad
6.Modern Communication systems (Principles and application): Leon W. Couch II (PHI)
7.Error Control Coding: Shu Lin & Daniel J.Costello

SIXTH SEMESTER BE ELECTRONICS ENGINEERING

Course Code : **6BEEN605**

Title of the Course **: ELECTIVE II Mechatronics**

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/ week	Credits	Duration of paper (hrs)	MSE	IE	ESE	Total
3	**1**	**0**	**4**	**4**	**3**	**10**	**10**	**80**	**100**

Unit	Contents	Hours
I	. Introduction to Transducer and Mechatronics: Measurement systems, static characteristics, Classification of Transducers and Sensors, Basic Divider Circuits, Bridge Circuits, Filters, Level measurements, strain measurements: Strain Gauge principles, types, strain gauge circuits, Load cells, temperature Compensation. Temperature measurement: Thermisters, RTD, Thermocouples	
II	Mechanical Sensors, Displacement& Position sensors: Potentiometric Sensor, Capacitive and Inductive Sensors, Variable Reluctance Sensors, Linear Variable Differential Transformers. Motion Sensors: Translational and Rotary Optical Encoders, Tachometers with output signal as electrical quantity.	
III	Converters and Controller and Data Acquisition system: Concept of sampling, sample & hold operation, analog to digital converters, digital to analog converters. Introduction to SCADA & its applications, System Models: Mathematical models, introduction to mechanical, electrical, fluid and thermal system. Rotational and transnational systems, Basic concepts of transfer function.	
IV	Controller Principles Control systems: Types of control system, Open loop, closed loop systems, transfer functions, feed back and feed forward control systems and their applications. Process Characteristics: Process equation, process load, Error, Variable range, Control Parameter Range, Dead time.	
V	Controller Modes: Continuous Controller Modes, Proportional Controller, Integral Controller, Derivative Controller, with mathematical equations, advantages, disadvantages and applications. Composite controller Modes: Proportional, Proportional +Integral(PI), Proportional+ Derivative(PD), Proportional + Integral + Derivative(PID) controllers, with simple numerical treatment.	

TEXT BOOK 1] Johnson C.D., Process Control Instrumentation Technology, Prentice Hall of India Pvt Ltd., New Delhi.

Reference Books

1 Doebelin E.O., Measurement System-Application and Design, Tata McGraw Hill Publications Ltd., New Delhi.

2] Bolton W., Mechatronics : A Multidisciplinary Approach Pearson Education

3] Rangan C.S. Sarma G.R., Mani V.S, Instrumentation Devices and Systems, Tata McGraw Hill Publishing Company Ltd.,New Delhi.

4] Histand B.H. AlciatoreD.G. ,Introduction to Mechatronics and Measurement Systems. HMT, Mechatronics, HMT.

5] Mahalik N. g Company Ltd.,New Delhi.

Text Books:

1.Digital communication: John G Prokis (TMG)
2.Digital communication: Simon Haykin (WEP)

Reference Books:

1.Lathi B.P. -Modern Digital and Analog communications systems -PRISM Indian Ed.
2.Digital Communication: J.S.Chitode
3.Digital Communication (Fundamentals & applications): Bernard Scalr
4.Introduction to Error Control Codes: Salvatore Gravano
5.OFDM For wireless communication systems: Ramjee Prasad
6.Modern Communication systems (Principles and application): Leon W. Couch II (PHI)
7.Error Control Coding: Shu Lin & Daniel J.Costello

FIFTH SEMESTER BE ELECTRONICS ENGINEERING

Course Code :6BEEN06

Title of the Course : PRINCIPLES OF COMMUNICATION ENGINEERING(LABORATORY)

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**2**	**25**	**25**	**50**

List of suggested practical's
1. Study of Amplitude modulation and demodulation.
2. Study of Frequency modulation and Demodulation.
3. Study of AM transmitter And Receiver.
4. Study of FM transmitter and receiver.
5. Study of SSB and DSB.
6. Study of PAM.
7. Study of PWM.
8.Study of PPM
9. Study of Delta Modulation.
10. Study of Adaptive Delta Modulation.
11. Study of TDM.
12. Study of FDM.

SIXTH SEMESTER B.E. ELECTRONICS ENGINEERING

Course Code :6BEEN07

Title of the Course : MICROCONTROLLER AND APPLICATIONSLABORATORY

Course Scheme				Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Credits	TW	POE	Total
0	0	2	2	25	25	50

Course Objectives:

- Understand Hardware organization, Instruction Set, Bus structure, peripheral Support devices and Application of 8051Microcontroller.
- Learn the Assembly Language as well as C language programming for8051.
- Develop lab experiments based on8051.
- Understand the use of real-time interrupt structure, programming timer and precise timing Control, Analog to Digital converter, Serial communication and system interface.

Suggested list of experiments: (Using Keil software):-

1. Programs illustrating Data Transfer Operations
2. Programs illustrating Arithmetic Operations
3. Programs illustrating Boolean &Logical Operations
4. Programs illustrating Conditional CALL & RETURN instructions
5. Programs illustrating different code conversions
6. Programs using Timers, Counter, Serial Ports and Interrupts
7. Keyboard interface to8051
8. Traffic light interface to8051
9. External ADC and Temperature control interface to8051
10. Logic controller Interface to8051
11. Elevator interface to8051
12. ON/OFF alternate LEDs by sequential keys
13. Display string on LCD using
14. Create the delays with timers &interrupts
15. Read A/D value, convert it to actual & display it on LCD

Course Outcome:

To understand the architecture of 8051 microcontroller and how to write Assembly and high level languages as well as interfacing.

SIXTH SEMESTER B.E. ELECTRONICS AND COMMUNICATION ENGINEERING/ ELECTRONICS AND TELECOMMUNICATION ENGINEERING

Course Code : 6BEEN608

Title of the Course : INDUSTRIAL TRAINING/ INTERNSHIP/CASE STUDIES

Course Scheme				Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Credits	TW	POE	Total
0	0	2	2	25	25	50

Two to four weeks of training in an Industry/Institute/Research organization/NGO/Environmental studies. The internship should give exposure to the practical aspects of the discipline. In addition, the student may also work on a specified task or project which may be assigned to him/her. The outcome of the internship should be presented in the form of a certified report.

 # Industrial Training /Internship/Case Studies:- It is to be completed during the summer vacation after completion of fourth semester and/or winter vacation after the completion of Fifth semester and its planning and allocation should be done during the fourth/ fifth semester and its marks will be awarded in the sixth semester for subject code 6BEET09 on submission of the certified relevant report at the end of sixth semester.

on Minor project

References:

1. PCB Design by Bosh art, TMH publications.
2. Integrated Circuit Fabrication Technology by Elliot TMH publications.
3. Manuals of ORCAD and Eagle.