GONDWANA UNIVERSITY, GADCHIROLI

FACULTY OF ENGINEERING AND TECHNOLOGY

CONSLIDATED STATEMENT OF VARIOUS PARAMETERS IN TEACHING & EXAMINATION SCHEME OF B.E. (ELECTRONICS AND COMMUNICATION ENGINEERING / ELECTRONICS AND TELECOMMUNICATION 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	19	8	24	500	200	700
5	V	5	4	19	8	24	500	200	700
6	VI	5	4	20	8	24	500	200	700
7	VII	5	3	20	8	24	500	150	650
8	VIII	5	2	20	8	24	500	200	700
		30	**20**	**117**	**46**	**142**	**3000**	**1100**	**4100**

Subject wise Board of Studies Affiliation

Board of Studies	**Subject Codes**
APPLIED SCIENCES & HUMANITIES	3BEET01, 4BEET01, 4BEET09
ELECTRICAL ENGINEERING	3BEET05, 5BEET03, 6BEET01
COMPUTER SCIENCE/IT ENGG	4BEET08, 8BEET05
ETC ENGINEERING	Rest all ,except above enlisted
EN/ETC/ECE COMMOMN	ET302/EN302, ET305/EN305,ET 403/EN403, ET405/EN404 ET501/EN501,ET502/EN502, ET601/EN601,ET602/EN602,ET701/ET701,ET801/EN801

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 and Communication Engineering/ Electronics and Telecommunication 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						
3BEET01	Applied Mathematics-III	4	0	0	4	3	80	10	10	100	40	--	--	--	--
3BEET02	Digital Electronics	3	1	0	4	3	80	10	10	100	40	--	--	--	--
3BEET03	Electronic Devices & Circuits	3	1	0	4	3	80	10	10	100	40	--	--	--	--
3BEET04	Electronic Measurements & Instrumentation	3	1	0	4	3	80	10	10	100	40	--	--	--	--
3BEET05	Network Theory	3	0	0	3	3	80	10	10	100	40	--	--	--	--
Laboratories															
3BEET06	Digital Electronics	0	0	2	1	--	--	--	--	--	--	25	25	50	25
3BEET07	Electronic Devices & Circuits	0	0	2	1	--	--	--	--	--	--	25	25	50	25
3BEET08	Electronic Measurements & Instrumentation	0	0	2	1	--	--	--	--	--	--	25	25	50	25
Total		**16**	**3**	**6**						**500**				**150**	
Semester Total		**25**			**22**										**650**

Appendix A

Four Year Degree Course in Engineering and Technology
Course and Examination Scheme with Choice Based Credit System
Fourth Semester B.E. (Electronics and Communication Engineering/ Electronics and Telecommunication 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						
4BEET01	Applied Mathematics-IV	4	0	0	4	3	80	10	10	100	40	--	--	--	--
4BEET02	Analog Circuits	3	1	0	4	3	80	10	10	100	40	--	--	--	--
4BEET03	Electromagnetic Fields	3	1	0	4	3	80	10	10	100	40	--	--	--	--
4BEET04	Electronic Engineering Materials and Components	3	0	0	3	3	80	10	10	100	40	--	--	--	--
4BEET05	Microprocessor and interfacing	3	1	0	4	3	80	10	10	100	40	--	--	--	--
Laboratories															
4BEET06	Analog circuits	0	0	2	1	--	--	--	--	--	--	25	25	50	25
4BEET07	Microprocessor and interfacing	0	0	2	1	--	--	--	--	--	--	25	25	50	25
4BEET08	Object oriented language Lab	0	0	2	1	--	--	--	--	--	--	25	25	50	25
4BEET09	**Personal proficiency**	0	0	2	1							50		50	25
Total		**16**	**3**	**8**						**500**				**200**	
Semester Total		**27**			**23**										**700**

III Semester B.E.

Electronics and Communication Engineering/ Electronics and Telecommunication Engineering

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

Course Code : **3BEET01**

Title of the Course : **APPLIED MATHEMATICS III**

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

Unit	Contents	Hours
I	**Laplace Transform**	
	Definition, Properties (statements only). Periodic functions and unit step function, Inverse Laplace transform by partial fractions and convolution theorem. Solution of ordinary linear differential equations with constant coefficients by Laplace transform	11
II	**Matrices**	
	Inverse of matrix by adjoint and partitioning method, Rank of a matrix and consistency of system of linear simultaneous equations , Linear dependence ,Linear and orthogonal transformation , Eigen values and eigen vectors, Reduction to diagonal form	08
III	**Matrices**	
	Cayley-Hamilton Theorem, Sylvester's Theorem (statements only) Solution of second order linear differential equation with constant coefficient by matrix method. Largest eign value and corresponding eign vector by iteration	08
IV	**Partial Differential Equations**	
	Linear Partial Differential Equations -first order and first degree i.e. Lagrange's form, Linear homogeneous equations of higher order with constant coefficients ,Method of separation of variables.	08
V	**Fourier series and Fourier Transforms**	
	Periodic functions and their Fourier series expansion, Fourier Series for even and odd functions, Change of interval, Half range expansions, Fourier integrals and Fourier Transforms.	10

Text Books:

1. Higher Engineering Mathematics -B.S.Grewal,Khanna Publications
2. Probability and Statistics by Murray R Spiegel 3/e Schaum's Outline Series
3. Higher Engineering Mathematics By H.K.Dass S.Chand

Reference Book:

A Text Book of Engineering Mathematics by N.P. Bali and Manish Goyal Laxmi Publications

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

Course Code : **3BEET02**

Title of the Course : **DIGITAL ELECTRONICS**

Course Outcome:-

Students will be able to

1) Simplify the logic expressions using Boolean laws, postulates, map & tabular method and design them by using logic gates.

2) Identify and describe logic Integrated circuit families including operation of CMOS logic gate.

3) Analyze and design digital combinational circuits like Encoders, Decoders, Multiplexers, De-multiplexers Digital comparator and Code convertor including arithmetic circuits like Adder, Subtractor and Multiplier.

4) Analyze and design of sequential circuits like Flip-Flops, Registers, Counters and State Machine.

5) Demonstrate knowledge of operation of memory devices: RAM, ROM, Flash memory and PLA including data convertors like ADC and DAC.

Title of the Course: **DIGITAL ELECTRONICS** 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**

Unit	Content	Hours
I	**INTRODUCTION**	
	Motivation for digital systems-logic, Logic gates, Number systems, Boolean algebra, Minimization of Boolean functions using Boolean identities, K-maps (up to 4 variables) and Quine-Mc-Cluskey method (up to 6 variables)	9
II	**DIGITAL LOGIC FAMILIES**	
	Characteristics of Digital ICs, Study of logic families: RTL, DTL, TTL, ECL, IIL, CMOS and Tristate logic. Logic gates and their static CMOS implementations	8
III	**COMBINATIONAL LOGIC**	

	Arithmetic circuits: Half and Full Adder/Subtractor, Parallel Adder/Subtractor, BCD Adder/Subtractor, Digital Comparator, Multiplexer, De-Multiplexer, Encoder, Decoder, Code Converters, Realization of Combinational circuits	10
IV	**SEQUENTIAL LOGIC**	
	Shift Registers, Latches, Flipflops: SR, D, T, JK and MS-JK, Conversion of one Flip Flop to Another, Finite state machines. Synchronous Counters: Binary, UP/DOWN, BCD counter and its designing. Asynchronous Counters: Binary, Ripple and BCD ripple Counter	10
V	**SEMICONDUCTOR MEMORIES**	
	Semiconductor memories: RAM, SRAM, DRAM, ROM, PROM, EPROM and flash memory. Introduction to PLA, Realization of combinational circuits using PLA. Data converters: Sample and hold circuits, ADCs and DACs	**8**

Text Books:

1. Modern Digital Electronics, R.P. Jain, 3 edition, Tata Mc-Graw Hill.
2. Digital Electronics, Soumitra Kumar Mandal, Mc-Graw Hill.

Reference books

1. Digital Principles and Application, A. P. Malvino, D. P. Leach, Tata Mc-Graw Hill
2. Digital Logic and Computer Design, M. Morris Mano, 3E, Prentice Hall India Ltd.
3. Principles of Modern Digital Design, Parag K. Lala, Wileys Interscience.
4. Switching & Finite Automata Theory, Kohavi Zvi, Tata Mc-Graw Hill.

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

Course Code : **3BEET03**

Title of the Course : **ELECTRONIC DEVICES AND CIRCUITS**

Course Outcomes:

1. To understand the physical construction, working and operational characteristics of Semiconductor devices.
2. To understand the working of transistors, its various configuration and their applications.
3. Able to design simple circuits containing non-linear elements such as transistors using the concepts of load lines and operating points.
4. To analyze the basic principle, operation and applications of JFET and MOSFET
5. To analyze various parameters of power amplifier.

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	**P-N Junction Diode and its applications**	
	Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt-ampere Characteristics, Temperature dependence of diode VI characteristic, Ideal versus Practical ,static and dynamic resistance of a diode, Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes. Principle of Operation and Characteristics of Zener Diode and Voltage Regulation using Zener Diode. The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier. Filters: filters: capacitive filter, inductive filter, L-C & C-L-C Filters .	10
II	**Bipolar Junction Transistor**	
	Transistor Construction, BJT Operation, Transistor Current Components Transistor as switch, Common Base, Common Emitter and Common Collector Configurations and its input, output characteristics. BJT Specifications, Transistor as an Amplifier, analytical expression (Ebers-moll model) for transistor characteristics **The Transistor at Low Frequencies:** Two-port Devices and the Hybrid model, Transistor Hybrid model, Analysis of a transistor amplifier circuit using h parameters, Millers Theorem and its dual, cascading transistor amplifiers	14
III	**Transistor Biasing and Stabilization**	

	Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in VBE and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability **The Transistor at High Frequencies:** The hybrid-pi (π) Common Emitter transistor Model, hybrid-π Conductances and Capacitances.	12
IV	**Field Effect Transistor**	
	Junction Field Effect Transistor Construction and principle of operation, JFET characteristics, JFET Small Signal Model, MOSFET Construction and principle of operation, MOSFET Characteristics in Enhancement and Depletion modes.FET Biasing , FET Amplifiers: FET Common Source Amplifier, Common Drain Amplifier,FET as Voltage Variable Resistor.	12
V	**Power Amplifiers**	
	Introduction, difference between voltage amplifier and power amplifier, classification of power amplifiers, overall and collector efficiency of power amplifiers, Transformer coupled class A amplifier, Push pull class B amplifier, complementary symmetry class B amplifier, cross over distortion.	12

Text Books:

1. Integrated Electronics – Millman & Halkias, Tata McGraw Hill Company.
2. Electronic Devices and Circuits by Millman Halkias (2 nd edition, McGraw Hill Publications)
3. Electronic Devices and Circuit Theory by Robert L. Boylestad (PHI Publications)

Reference Books:

1. Electronic Devices and Circuit by Allen Motorshed Eastern Economy Edition
2. Electronic Devices and Circuits by David A. Bell (PHI Publications)

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

Course Code : **3BEET04**

Title of the Course : **ELECTRONIC MEASUREMENTS AND INSTRUMENTATION**

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**

Unit	Contents	Hours
I	**INTRODUCTION**	
	Statistical analysis of measurement of errors, accuracy, precision types of errors, Digital voltmeter: Characteristic features, advantages and applications, Digital LCR meter, Digital Multimeter	9
II	**BRIDGES & THEIR APPLICATIONS**	
	Bridges: Wheat stone, Kelvin, Max-well, Ray, Schering, Wienbridge Potentiometer, Measurement of Inductance, Capacitance using AC bridges, measurement of frequency	9
III	**SENSORS & TRANSDUCERS I**	
	Generalized instrumentation systems, active & passive transducers, primary and secondary transducers, digital & analog transducers, static & dynamic characteristic, Variable inductance transducers, Self generating & passive type, LVDT, Piezoelectric transducers, Proximity sensors: Eddy current, Capacitive and Inductive type	9
IV	**SENSORS & TRANSDUCERS II**	
	Laws of thermoelectric circuits, thermocouples, cold junction compensation, thermistors, Resistance temperature detector, radiation pyrometer, optical pyrometer, temperature measurement of flowing liquids, Strain Gauges: Wire wound, foil, semiconductor & capacitor types, Strain gauge circuits: Ballast, Wheatstone Bridge, Temperature compensation, Calibration of Strain gauge, Light sensors: Photodiodes, phototransistors, photoresistors.	9
V	**SIGNAL CONDITIONING AND BUS STANDARDS**	
	Signal conditioning techniques: linearization, gain clipping, filtering, differential amplification, shielding techniques, data acquisition systems, IEEE 4888 bus & I2C bus: principle of operation, protocols	9

Text Books :

1.A Course in Electrical /Electronic Measurement and Instrumentation –A.K.Sawhney Dhanpat Rai & Sons, Delhi

2.Instrumentation Devices & Systems-Ranjan C.S.,Sharma G.R. and Mani V.S.V.,Tata McGraw Hill Publications

Reference Books:

1.Sensors and Transducers –Patranbis D ,A H Wheeler and Company

2.Measurement System application and Design-E O Doebelin Tata Mc Graw Hill

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

Course Code : **3BEET05**

Title of the Course : **NETWORK THEORY**

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

Unit	Contents	Hours
I	**INTRODUCTION**	
	Nodal and Mesh analysis of networks, source transformation, mutual inductances in mesh and nodal analysis, Duality.	9
II	**NETWORK THEOREMS**	
	Network Theorems (Applications to ac networks): Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Millman's theorem, Compensation theorem, Tellegen's theorem.	9
III	**FOURIER SERIES AND GRAPH THEORY**	
	Fourier series, Evaluation of Fourier coefficients, waveform symmetries as related to Fourier coefficients, Exponential form of Fourier series, steady state response to periodic signals, Fourier integral and transform. Graph theory: Graph of a network, tree, co-tree, basic loop and basic cut set, incidence matrix, cut set matrix, Tie-set matrix.	9
IV	**LAPLACE TRANSFORMS & TRANSIENT RESPONSE OF NETWORKS**	
	Definition of Laplace transform, properties of Laplace transforms, Laplace transform theorems, inverse Laplace transform, Laplace transform of periodic functions, Convolution integral, Partial fractions, applications of Laplace transforms. Transient behaviour, initial conditions, concept of complex frequency, driving points and transfer functions, Poles and zeros of network functions, restrictions on Pole and Zero locations for driving point functions, restrictions on Pole and Zero locations for transfer functions, time domain behaviour from the Pole and Zero plot.	9
V	**TWO PORT NETWOKS**	
	Relationship of two-port variables, short circuit admittance parameters, open circuit impedance parameters, transmission parameters, hybrid parameters, relationships between parameter sets, parallel connection of two port networks. Three phase unbalanced circuits and power calculations.	9

Text Books

1.Network analysis by M.E. Van Valkenburg, Prentice Hall of India Pvt.Ltd.

2.Linear network theory by Kelkar and Pandit, Pratibha publication, Nagpur.

Reference Books:

1.Engineering Network analysis and filter design by Gopal Bhise, Prem Chaddha, D. Kulshreshtha Umesh publication, Delhi.
2.Circuit theory by a. Chakrabarti, Dhanpat Rai and co.
3.Circuit and Networks by A. Sudhakar, Shyammohan, Tata McGraw Hill.

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

Course Code : **3BEET06**

Title of the Course : **DIGITAL ELECTRONICS**

Title of the Course: **DIGITAL ELECTRONICS** Course Scheme				Evaluation Scheme(Laboratory)			
Lecture	Tutorial	Practical Hrs	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**1**	**25**	**25**	**50**

It includes at least 8-10 experiments based on the theory syllabus of Digital Electronics (ET 304)

List of suggested experiments

1) To study and verify the truth table of Logic and universal gates.

2) To implement combinational circuit using logic gate and verify its truth table.

2) To implement De-Morgans Law using logic gate and verify its truth table.

3) To implement Half Adder/Subtractor circuit and verify its truth table.

4) To implement Full Adder/Subtractor circuit and verify its truth table.

5) To study the concept of Multiplexer and verify its truth table.

6) To study the concept of Demultiplexer and verify its truth table

7) To implement Code Convertor circuit and verify its truth table.

8) To study the concept of S-R, J-K & D Flip Flop and verify its truth table.

9) To implement one type of flip flop using another type flip flop and verify its truth table.

10) To implement the Johnson's/Ring/Up/Down counter using J K flip flop and verify its state.

11) To design synchronous counter using flip flop and verify its state.

THIRD SEMESTER B.E. ELECTRONICS ENGINEERING

Course Code : **EN 306**

Title of the Course : **ELECTRONICS DEVICES AND CIRCUITS**

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**1**	**25**	**25**	**50**

It includes at least 7-8 experiments based on the theory syllabus of Electronics devices and circuits.

(At least two experiments should be conducted using simulator like Pspice)

List of suggested experiments
1. Analyzing V-I characteristics of p-n junction diode 2. Design of half wave rectifier 3. Design of full wave rectifier 4. Design of Bridge rectifier 5. Analyzing V-I characteristics of Zener diode 6. Design of voltage regulator using zener diode. 7. To obtain input and output characteristics of CE configuration BJT. 8. To obtain input and output characteristics of CB configuration BJT. 9. To obtain input and output characteristics of CC configuration BJT. 10. To obtain Drain and Transfer characteristics of FET 11. Analyzing the frequency response of single stage CE amplifier. 12. Analyzing the performance of push-pull amplifier.

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

Course Code : **3BEET08**

Title of the Course : **ELECTRONIC MEASUREMENTS AND INSTRUMENTATION**

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**1**	**25**	**25**	**50**

It includes at least 7-8 experiments based on the theory syllabus electronics Measurements and Instrumentation.

List of suggested experiments
1. Study of AC Bridges 2. Study of DC Bridges 3. To study characteristics and performance of different types of temperature transducers 4. Study of LVDT 5. Study of strain gauges 6. Study of light sensors 7. Study of thermocouples 8. Study of thermistor 9. Study of LCR meter

IV Semester B.E.

Electronics and Communication Engineering/ Electronics and Telecommunication Engineering

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

Course Code : **4BEET01**

Title of the Course : **APPLIED MATHEMATICS IV**

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

Unit	Contents	Hours
I	**Z- Transform**	
	Definition and propertie, Inverse Z-transform by partial fractions and convolution theorem. Application to solve difference equation with constant coefficients.	07
II	**Complex Variables**	
	Analytic functions Cauchy Riemann conditions, Conjugate functions, Singularities, Cauchy's Integral theorem and Cauchy's Integral Formula (statements only) Laurent's Theorem (statement only) Residue Theorem and application of residuals to evaluate Real integral of the form $\int_0^{2\pi} f(sin\theta, cos\theta)d\theta$ and $\int_{-\infty}^{\infty} \frac{f(x)}{F(x)}dx$ where F(x) has no zeros on real axis.	11
III	**Numerical Methods**	
	Solution of algebraic and transcendental equations by False position method, Newton-Raphson method. Non linear simultaneous equations by Newton-Raphson Method. Solution of system of simultaneous linear equations by Gauss Jordan method, Gauss Seidel method, Crouts method	08
IV	**Numerical Methods**	
	Solution of ordinary first order first degree differential equation by Taylor's series method, Runge-Kutta 4th order method, Euler's modified method, Milne's Predictor Corrector method. Largest eigen values and corresponding eigen vector by iteration method.	08
V	**Random Variables, and Probability Distribution**	
	Random variables Distribution functions of discrete and continuous random variables, Joint distributions, Mathematical Expectations, Moments, Moments generating function and Characteristic function. Coefficient of skewness and Kurtosis	11

Text Books

1. Higher Engineering Mathematics By B.S.Grewal Khanna Publications
2. Probability and Statistics by Murray R Spiegel Schaums outline Series
3. Higher Engineering Mathematics By H.K.Dass S Chand Publications

Reference Book:

1 Text Book of Engineering Mathematics by N.P. Bali and Manish Goyal Laxmi Publications

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

Course Code : **4BEET02**

Title of the Course : **ANALOG 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	**Feedback amplifiers**	
	The feedback concept, transfer gain with feedback, general characteristics of negative feedback amplifiers, input resistance, output resistance, method of analysis of a feedback amplifier, voltage series feedback, current series feedback, current shunt feedback, voltage shunt feedback.	8
II	**Frequency response of amplifiers**	
	Classification of amplifiers, distortion in amplifiers, frequency response of an amplifier, Bode plots, step response of an amplifier, bandpass of cascaded stages, RC coupled amplifier, low frequency of an RC coupled stage, effect of an emitter bypass capacitor on low frequency response, high frequency response of two cascaded CE transistor stages, multistage CE amplifier cascade at high frequencies, noise.	9
III	**Multi-vibrators and sweep generators**	
	Bistable multivibrators (BMV) - fixed bias, self bias, commutating capacitor, methods of improving resolution, symmetrical and unsymmetrical triggering, direct connected BMV, Schmitt trigger, emitter coupled BMV, monostable multivibrator (MMV) - collector coupled, emitter coupled MMV, triggering of MMV, astable multivibrator (AMV) - collector coupled, emitter coupled AMV. General features of a time base signal, exponential sweep circuit- UJT relaxation oscillator, transistor constant current sweep generator, miller and bootstrap sweep generator.	12
IV	**Differential amplifiers**	
	Differential amplifiers: Introduction, differential amplifier circuit configurations- DIBO- ac and dc analysis, DIUO, SIBO, SIUO, techniques to improve CMRR, biasing circuits-constant current sources, reference voltage sources, cascaded differential amplifier stages, level translator.	7
V	**Wave shaping circuits**	
	Clipping and comparator circuit, Diode & transistor clipper, diode-differentiator comparator, Clamping and switching circuit, Clamping circuit theorem, practical clamping circuits, transistor switch with inductive load, Damper diode, transistor switch with capacitive load, collector catching diode	9

Text book

1. Integrated Electronics, Jacob Millman, Christos C. Halkias, 3E, Tata McGraw Hill, 2006.
2. Pulse Digital and Switching Waveforms, Jacob Millman, Herbert Taub, Mothiki S Prakash Rao, 2E, Tata McGraw Hill, 2007.

3. Op-amps and Linear Integrated Circuits, R. A. Gayakwad, 4 edition, Prentice Hall of India, 2008

Reference Books

1. Electronic Devices and Circuits, D. R. Cheruku and B. T. Krushna, 2E, Pearson, 2008.
2. Linear Integrated Circuits, D. Roy Choudhury and S. B. Jain, 2E, New Age International

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

Course Code : **4BEET03**

Title of the Course : **ELECTRONIC ENGINEERING MATERIALS AND COMPONENTS**

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	**MAGNETIC AND DIELECTRIC MATERIALS**	
	Magnetic materials: ferro magnetic, ferri magnetic, antiferro magnetic, para and diamagnetic materials with examples, magnetically soft and hard materials,dielectric parameters, polarization, polarizability, types of polarization, internal or local electric field , derivation of lorentz equation , clausius - mossotti equation, dielectric loss and breakdown, ferroelectric, piezo electric & pyroelectric materials.	11
II	**CONDUCTING AND SUPERCONDUCTING MATERIALS**	
	Conductivity of pure metals & alloys, temperature coefficient of resistivity, high conductivity materials, high resistivity materials, heating elements, fuses, contact materials, connectors, switches, heat sinks, fixed and variable resistors non linear resistors, resistors used in electronic circuits, superconductivity, type I & II materials, high temperature superconductivity, applications of superconductivity.	9
III	**SEMICONDUCTING MATERIALS**	
	Semiconductors, band gap, electron & hole mobilities. Purification & doping of semiconductor materials, characteristics of semiconductor devices, diodes, zener & breakdown diodes, tunnel diodes, varactors, transistors (BJT, FET, MOSFET, UJT), DIAC, SCR & TRIAC, hall effect devices.	9
IV	**SEMICONDUCTOR FABRICATION AND OPTICAL PROPERTIES OF MATERIALS**	
	LSI, VLSI ,Czochralski Crystal Pulling Technique, Fabrication of linear & digital ICs, CMOS devices, Energy levels and spontaneous emission of light,Stimulated emission,Absorption reflection and refraction of light ,Interaction of light with electrons in solids,Optical effects in semiconductors,LED, LASERS, Optical communication	7
V	**NANOMATERIALS**	
	Introduction - Nanomaterials: definition, properties, Types: Nanoparticles, Synthesis by Chemical reduction method, Nanoporous materials: Synthesis by Sol-gel method, Nanowires: Synthesis by VLS mechanism, Carbon Nanotubes: Singlewalled and multiwalled nanotubes, Mechanical and electrical properties ,Applications, Synthesis: Electric arc discharge method , Physical Vapour Deposition (PVD), Chemical Vapour Deposition (CVD), Laser Ablation method.	9

Text book

1.Electrical engineering materials –S.P.Seth Dhanpat rai & Sons

2.Introduction to Nanotechnology, Charles P.Poole Jr, and Frank J Owens .Wiley Interscience

Reference Books

1.Electronic engineering materials and devices-Allison

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

Course Code : **4BEET04**

Title of the Course : **ELECTROMAGNETIC FIELDS**

COURSE OBJECTIVES:

1. To acquire the knowledge of Electromagnetic field theory that allows the student to have a solid theoretical foundation to be able in the future to design emission, propagation and reception of electromagnetic wave system.
2. To identify, formulate and solve fields and electromagnetic waves propagation problems in a multidisciplinary frame.
3. To provide the students with a solid foundation in Electromagnetic fundamentals required to solve problems and also to pursue higher studies.

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	**VECTOR ANALYSIS**	
	Scalars and Vectors, Vector algebra, Coordinate systems (Cartesian, Cylindrical, Spherical),Differential Length, Differential Area and Differential Volume, Line Integral, Surface Integral and Volume Integral, Del operator, Gradient, Divergence, Curl	7
II	**ELECTROSTATICS**	
	Coulomb's law, Electric field intensity, Electric Field due to point charge, line charge and sheet of charge, Electric flux density, Gauss's law and its applications, Divergence theorem, Electric potential, Potential Gradient, Conservative Property, Current Density, Continuity of Current, Method of Images, Electric Boundary conditions, Poisson's and Laplace's equations, Capacitance, Energy Density	11
III	**MAGNETOSTATICS**	
	Biot-Savart's law, Ampere's law and its applications, Stoke's theorem, Magnetic field due to straight infinite conductor, circular loop, infinite sheet of current, infinitely long coaxial transmission line, ideal Solenoid, ideal Toroid, magnetic flux and magnetic flux density, Scalar and Vector Magnetic Potential, Force on a differential current element, Force between differential current elements, magnetic materials, Magnetization and Permeability, Magnetic Boundary conditions, Inductance	11
IV	**TIME VARYING FIELDS & MAXWELL'S EQUATIONS**	
	Faradays law, Transformer and Motional emf, Displacement Current, Time Varying Maxwell's equations(differential & integral forms), Retarded Potential	4

V	**ELECTROMAGNETIC WAVE PROPAGATION**	
	Electromagnetic wave equations, Uniform Plane Waves, Wave propagation in free Space, Wave Propagation in Material Media(Conductors and Dielectrics), Wave Polarization, Poynting Vector and The Flow of Power, Reflection of Plane Wave at Normal Incidence, Reflection of Plane Wave at Oblique Incidence (Parallel and Perpendicular Polarization)	12

Text Books :

1. William H. Hayt, 'Engineering Electromagnetic' Tata Mcgraw Hill, Edition2001
2. John D. Kraus, 'Electromagnetic' Tata Mcgraw Hill, Book Co. New York 4th Edition

Reference Books :

1. Matthew N. O. Sadiku 'Element of Electromagnetic' Second Edition, oxford university press 1995.
2. Edward C. Jordan, Keith G. Balmin, 'Electromagnetic Waves and Radiating Systems', Second Edition, Prentice Hall of India Private Limited

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

Course Code : **4BEET05**

Title of the Course : **MICROPPROCESSOR AND INTERFACING**

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 8085**	
	8085 Architecture and pin diagram,Addressing modes,instruction set, assembly language programming, instruction timing diagram.	10
II	**INTERFACING TECHNIQUES**	
	Stack and subroutines, counters and time delays, Interrupt system of 8085 μP serial data transfer through SID and SOD lines ,memory map, memory mapped I/O port and I/O mapped I/O port, , address decoding techniques, interfacing of memory with 8085 μP.	12
III	**MICROPROCESSOR PERIPHERALS**	
	Internal architecture of 8255-programmable peripheral interface, interfacing of 8255 with 8085, interfacing of 8255 with stepper motor ,8259-Priority Interrupt Controller, 8253-Progammable Interval Timer/Counter, 8257-Programmable DMA Controller , and 8251 USART	14
IV	**PRINCIPLE OF DATA CONVERSION**	
	Study of ADC 0809 and DAC 0808 ,Analog-to-Digital and Digital-to-Analog,conversion , interfacing of ADC & DAC with 8085 μP, application of ADC in temperature measurement	12
V	**INTRODUCTION TO 8086**	
	Architecture and operation of 8086μP,Addressing modes, instruction set, memory management, max and min mode, simple assembly language programming,	12

Text Book:

1. Microprocessor, Architecture, Programming and Applications with 8085, Ramesh S. Gaonkar, 5E, Penram International Publication.
2. Microprocessors And Interfacing, D.V.Hall, 2E, Tata McGraw-Hill.

Reference Books:

1.Introduction to Microprocessor for Engineers and Scientists, P. R. Sridhar and P. K. Ghosh, 2E, Prentice Hall India Ltd, 2005.

2.Introduction to Microprocessor, Aditya P. Mathur, 3E, Tata McGraw-Hill, 2004.

3.Advanced Microprocessors and Peripherals, A. K. Ray and K. M. Bhurchandi, 2E, Tata McGraw-Hill, 2008.
4.8085 Microprocessor: Programming and Interfacing, N. K. Srinath, 1E, Prentice Hall India Ltd,.

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

Course Code : **4BEET06**

Title of the Course : **ANALOG CIRCUITS**

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**1**	**25**	**25**	**50**

It includes at least 7-8 experiments based on the theory syllabus of analog circuits.

List of suggested experiments
1. Implement voltage shunt feedback amplifier and calculate various parameters. 2. Simulate, voltage-series, current-series and current-shunt feedback topologies and measure various parameters. 3. High frequency response of cascaded amplifier. 4. To find out fL and fH from square wave testing of amplifier. 5. To measure voltage and current levels at stable state of BMV. 6. To Design and implement MMV/AMV. 7. Simulate, BMV, MMV, AMV and compare their results with implemented one. 8. Implement DIBO differential amplifier and measure its parameters. 9. Design and implement UJT relaxation oscillator.

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

Course Code : **4BEET07**

Title of the Course : **MICROPROCESSOR AND INTERFACING**

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**1**	**25**	**25**	**50**

It includes at least 7-8 experiments based on the theory syllabus of Microprocessor and interfacing.

List of suggested experiments
1.Write an ALP for microprocessor 8085 to add 10 data bytes 2.Write an ALP for microprocessor 8085 to find occurrence of 0's in lower nibble of data byte 3.Write an ALP for microprocessor 8085 to reverse an array stored from memory location. 4.Write an ALP for microprocessor 8085 to arrange an array in descending order. 5.Write an ALP for microprocessor 8085 using subroutine to calculate factorial of number. 6.Write an ALP for microprocessor 8085 to multiply two 8 bit number using add & shift method. 7.Write an ALP to interface ADC/DAC to microprocessor 8085. 8.Write an ALP to interface 8255 to microprocessor 8085. 9.Write an ALP to interface 8253/8279/8251/8237 to microprocessor 8085. 10.Write an ALP for microprocessor 8086 to multiply two 8 bit number. 11.Write an ALP for microprocessor 8086 to arrange an array in ascending order.

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

Course Code : **4BEET08**

Title of the Course : **OBJECT ORIENTED LANGUAGE LAB**

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**1**	**25**	**25**	**50**

Contents
Object oriented paradigm: Introduction to structured versus object oriented development, concept and advantages of OOP's, elements of OOP's – objects, classes, encapsulation, inheritance, polymorphism, basic, derived and user defined data type operators, control statements, structure of C++ programming. Functions and classes: Class specification, class objects, class definition, public/private classes, member access, defining member functions, constructors and destructors, virtual and friend functions, function and operator overloading.Inheritance and polymorphism: Defining derived classes, forms of inheritance, inheritance and member accessibility. Applications: Applications in GUI design.

It includes at least 7-8 programs based on above syllabus

List of suggested programs
1.Write a C++ program to find the absolute value of an integer using a function. 2.Write a C++ program to show multiple base classes. 3.Write a C++ program that reads 5 student names and grades then prints the number of pass and fail Students. 4.Write a C++ program to read an input file of numbers and print all the count of positive numbers to one file and count of all negative number in another file. 5.Write a C++ program to print a table of any number inputted by user using while loop in C++. 6.Write a C++ program to calculate area of circle and print the same. 7.Write a C++ program that counts the number of occurrences of a particular number from a given list of numbers. 8.Write a program in C++ to print the following series 0,1,2,3,4,6,11,.....,1000. 9.Write a C++ program that enters a number and find how many times the smallest digit occurred. 10.Write a C++ program to solve the following equation Y=1/2!-2/3!+3/4!-4/5!+….n/ (n+1)! 11.Write a C++ program that computes the roots of a quadratic equation and display the roots.

Text Books:

1.Object Oriented Programming with C++, E. Balagurusamy, 2E, Tata McGraw Hill Publications, New Delhi,.
2. Teach Yourself C++, Herbert Schildt, 3 edition, Tata McGraw Hill.

Reference Books:

1. Mastering C++, K. R. Venugopal, 1 edition, Tata McGraw Hill.
2. Object Oriented Programming in C++, K. R. Shukla, 1 edition, Wiley India Pvt. Ltd.

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

Course Code : **4BEET09**

Title of the Course : **PERSONAL PROFICIENCY I**

Course Scheme					Evaluation Scheme(Laboratory)		
Lecture	Tutorial	Practical	Periods/ week	Credits	TW	POE	Total
0	**0**	**2**	**2**	**1**	**50**	**0**	**50**

Contents
After completing this course the student should able to get proficiency in 1. Reading, Writing and Speaking Skills Effective reading: Uses of words, improving the vocabulary, The dictionaries and how to use them Writing skill: Writing letters at work, how to write reports, writing resume, job application, modes of address The skill of good speaking: improving your voice and speech, the art of conversation, public speaking, being interviewed by media, job interview, dealing with the boss, dealing with the subordinates, how to run a meeting, negotiating and selling. 2. Thinking skill: How to think, critical thinking and lateral thinking. 3. Memorising and memorising skills

Minimum 9 experiments based on above syllabus,

1. Vocabulary building (words/week)
2. Demonstration of audio, video CDs (LRs)
3. Reading and writing paragraphs from English daily.
1. Precise writing and comprehension.
2. Enriching communication with use of idioms and phrases.
3. Learning read/write/speak by listening to learning recourses
4. Supervised one to one, one to many and many to many communication (letter, extempore, board writing, telephonic conversation, debate, elocution etc.)
5. Demonstration of Audio, Video CDs of interviews, speeches etc.
6. Audio recording of the conversations and analyzing it offline.
7. Pronunciation of foreign language words commonly practiced. (French, Greek, Latin etc)
8. Six thinking hats/lateral thinking.
9. Practice of memorizing

References :

1. Communication in English for technical students, by Orient Longman, TTTI Calcutta
2. How to write and speak better, Reader's digest, Touchan Books Limited. Editor John Ellison Kahn
3. Six Hat thinking, by E. D. Bono, Pengwin Books
4. English Grammar by Wren and Martin.
5. Word Power Made Easy by Norman Lewis, Goyal Saab, Goyal Publishers