Jabalpur Engineering College, Jabalpur

Semester III Credit Based Grading System (CBGS) w.e.f. July 2017

Scheme of Examination

Bachelor of Engineering B.E. (Electronics & Telecommunication Engineering)

Subject wise distribution of marks and corresponding credits

Scheme of Examination w.e.f. July-2017 Academic Session-2017-18

S. No.	Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours / week.			Total Credits	Total Marks
			Theory			Practical		Total Marks					
			End Sem	Mid Sem. MST	Quiz, Assign ment	End Sem.	Lab Work		L	T	P		
1	**CH3001**	Energy, Environment, Ecology & Society	70	20	10	-	-	100	3	1	-	4	
2	**EC3002**	Digital Circuits & System	70	20	10	30	20	150	3	1	2	6	
3	**EC3003**	Electronic Devices	70	20	10	30	20	150	3	1	2	6	
4	**EC3004**	Network Analysis	70	20	10	30	20	150	3	1	2	6	
5	**EC3005**	Signal & Systems	70	20	10	-	-	100	3	1	-	4	
6	**CS3106**	Programming-I	-	-	-	30	20	50	-	-	2	2	
7	**EC3007**	1.Rural Outreach/Social service Activities under digital India or clean India 2.Evaluation of Industrial training (Internal Assessment)	-	-	-	-	50	50	-	-	2	2	
8	**EC3008**	NSS/NCC/Professional society activities (Internal Assessment)	-	-	-	-	50	50	-	-	2	2	
Total			**350**	**100**	**50**	**120**	**180**	**800**	**15**	**5**	**12**	**32**	**800**

MST: Minimum of two mid semester tests to be conducted.

L: Lecture **T: Tutorial** **P: Practical**

B.E.CBGS III SEMESTER
ENERGY, ECOLOGY, ENVIRONMENT & SOCIETY

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Energy, Ecology, Environment & Society	CH3001	Min. "D"	Min. "D"	5.0

Unit -I : Energy Sources and Energy Storing Devices :

World and Indian energy scenario, types of energy sources – renewable and non-renewable energy sources. Solar energy storage, application & maintenance of solar cell panel, introduction & applications of hydro, wind, biomass, ocean, tidal, wave and geothermal. Synergy between energy and environment. Global environment issues, greenhouse gas emission, global warming, green energy solution. Batteries – Primary and Secondary batteries- Alkaline battery – Lead (Pb) acid storage battery , Ni-cadmium battery ,Lithium battery, Fuel cell , Hydrogen Oxygen fuel cell ,Photo galvanic cell.

Unit -II : Ecosystem :

Structure & scope of ecology, Natural cycles of the environment, Hydrogen cycle, Oxygen Cycle, Carbon cycle, Nitrogen cycle, Phosphate cycle, Sulphur cycle, Biodiversity.

Society:-

Environmental problems and impact of P.A.T(Population, Affluence and Technology). Environmentally beneficial and harmful technologies, environment impact assessment policies (EIA).Ethics and regulatory act of environment.

Soil Pollution

Sources & control measures. MSW, HWM.

Unit -III : Air Pollution :

Chemical composition of atmosphere, -primary, secondary, pollutants, Chemical and photochemical reaction, effects of CO, SOx, NOx, HC and particulates. Causes & effects of acid rain, ozone depletion: Monitoring and control of air pollutants.

Noise Pollution :

introduction, physiological effect, measurement and control of noise pollutants.

Unit -IV : Water Pollution :

Sources causes of water pollution , types and nature of water pollutants. Pollution load determination i.e. particulates ,suspended matter, total dissolved solids ,dissolved gases DO, BOD & COD. EL NINO phenomenon. Waste water treatment Domestic – Aerobic & anaerobic treatment. Industrial waste water treatment (ETP plant.) Electro dialysis membrane technique and filtration by activated charcoal and synthetic resins.

Unite -V : Corrosion & its Prevention :

Theories of Corrosion and Mechanism – Dry (Direct Chemical attack), Wet (Electro Chemical Theory) Atmospheric corrosion, Galvanic Series, Galvanic & Concentration Cell Corrosion, Corrosion by sea water. Factors Influencing & control of Corrosion – Proper Design, Use of pure metal and metal alloys, passivity, cathodes protection – Sacrificial anode and Impressed Current. Modifying the environment, Use of inhibitors.

Books References :

1. J.C. Kuriakose and J. Raja ram, "Chemistry in Engineering and Technology", Vol.1 & 2, Tata Mcgraw Hill Publishing
2. Company (P) Ltd., New Delhi
3. Mars G. Fontana, "Corrosion Engineering", Tata Mcgraw Hill Publishing Company (P) Ltd., New Delhi.
4. F.Chau, Y. Liang, J. Gao and X. Shao, "Chemometrics", Wiley Inter Science.
5. A text book of Engineering Chemistry by Jain & Jain, Dhanpat Rai Publishing Company, New Delhi
6. Chemistry of Engineering Materials by C.P. Murthy, C.V. Agarwal and A. Naidu BS Publication Hyd.
7. A text book of Environmental Chemistry and Pollution control by S.S. Dara & Dr. D. D. Mishra, S. Chand & Co, New Delhi
8. Energy,Environment Ecology and Society by Dr.Pushpendra,Vayu Education of India New Delhi .
9. Energy, Environment Ethics and Society, by Dr.S.Deswal & Dr.A.Deswal Dhanpat Rai Publishing Company, New Delhi.

B.E.CBGS III SEMESTER
DIGITAL CIRCUITS & SYSTEM

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Digital Circuits & System	EC3002	Min. "D"	Min. "D"	5.0

Unit –I: Boolean Algebra and Switching Function:

Minimization of switching function. Concept of prime implicant etc.Karnuagh's map method, Quine & McCluskey's method, cases with don't care terms and multiple output,switching function, introduction to logic gates NAND, NOR realization of switching function.

Unit –II: Design and Analysis of Combinational Circuits :

Design and analysis of code convertor. half – adders, halfsubtractor,full adders, fullsubtractor circuits. Series & parallel adders and BCD adders. look-ahead carrygenerator and adders. Decoders, Encoders, multiplexers & demultiplexers. Designing of combinational circuitswith ROM and PLA.

Unit –III: Specification of Sequential System:

Characterizing equation & definition of synchronous sequential machinesRealization of State table from verbal description , Mealy and moore machines state table and transitiondiagram. Minimization of the state table of completely specifies sequential machines.

Unit – IV:Design and Analysis of Sequential Circuits:

Design and analysis of registers, synchronous & asynchronouscounters etc. introduction to asynchronous sequential machines. Races and hazards.

Unit –V: Algorithmic State Machine:

Controllers and data system designing.

Books References :

1. W. H. Gothman, "Digital Electronics" (PHI)
2. R.J. Tocci, "Digital System Principles & Application"
3. Z. Kohair (TMH), "Switching & Automata Theory"
4. M. Mano (PHI) "Digital Logic & Computer Design"
5. M. Mano (PHI) "Digital Design".

DIGITAL CIRCUIT & SYSTEMS LAB

List of Experiments :

1. To study the operation & working of various types of logic gets with the help of electronic kit.
2. To study of Binary Adder.
3. To study of Encoder & Decoder.
4. To study of multiplexer and demultiplexer.
5. Experiment on multivibrator, Astable, Bistable, Monostable.
6. Study of Binary subtractor.
7. Study of Analog to Digital convertor.
8. Study of Digital to Analog convertor.

B.E.CBGS III SEMESTER
ELECTRONIC DEVICES

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Electronic devices	EC3003	Min. "D"	Min. "D"	5.0

Unit-I : Junction Diode:

Fabrication techniques of P-N Junctions, unsymmetrical junctions, open circuit P-N Junction, energy band diagram of an open circuit P-N junction, voltage current relationship of P-N junction diode, Diode resistance, The current components in an P-N junction diode, diode characteristic and its temperature dependence, Junction capacitances, junction diode switching times.

Unit-II : Diode Circuits:

Diode as a circuit element, Piece-wise linear model, Load line concept, P-N junction diode as a Rectifier, Half wave rectifier ,Full-wave rectifier-Center-tapped and Bridge rectifier, Analysis of filters with Rectifiers-L,C,LC & Pi Filters, Voltage Multipliers, Clipper circuits - series and parallel clipper circuits , Clamper circuits- positive and negative clamper circuits , Comparators.

Unit-III : Junction Transistors – BJT:

Transistor fabrication techniques, Basic transistor operation, Transistor biasing, Current components in Transistor, Current amplification factors, Relationship between α and β, Base spreading resistance, Ebers – moll model, Transistor circuit configuration, Common Base Configuration ,Early effect and Base width Modulation, Common Emitter Configuration, Common Collector Configurations, Comparison of Characteristics of transistors in different Configurations, Transistor as an amplifier ,Transistor load lines, Transistor Maximum Ratings.

Unit – IV : Junction Field -Effect Transistor – FET:

Junction Field - Effect transistor (JFET), Static Characteristics curves of FET, The pinch-off voltage(Vp), volt ampere characteristics of JFET, FET as a Voltage dependent resistor, Metal-Oxide Semiconductor FET(MOSFET), Enhancement MOSFET(n-Channel, p-Channel), Depletion type MOSFET (n-Channel, p-Channel),Gate Protection in MOSFET, Symbols & Small Signal Models of JFET & MOSFET, Comparison of JFETs & MOSFETs,

Unit- V: Special Semiconductor Devices:

Thermistors, Sesistors, & Barretters, Gunn- Effect, Breakdown Diode, IMPATT & TRAPATT Devices, PIN Diode, Backward Diode, Schottky Diode, Tunnel Diode, Light Absorption Photoconduction ,Photoconductive Devices- Photoconductive cells & Photodiodes, Photovoltaic effect and Solar cells, Light emitting diode(LED),Thyristors- SCR,TRAIC,DIAC,SCS, Uni junction Transistor, Principle of Operation, Characteristic &Applications.

Books References:

1. Integrated Electronics: Milman J. and Halkias
2. Microeletronics Circuits: Sedra A.S . and Smith K.C.
3. Electronic Devices & cicuit Theory: Boylestad R. and Nashelsky L.
4. Pulse Digital and Switching Waveforms: Milliman J. and Taub H.
5. Electronic Circuits – Analysis and Design: Neamen
6. Electronic Ci
7. rcuits: Schilling D. L. and Belove C.

ELECTRONIC DEVICES & CIRCUITS LAB

List of Experiments:

1. Study of V-I Characteristics of P.N. Junction diode (Zener Diodes.)
2. To study & plot the drain current vs drain voltage : Characteristics of F.E.T.
3. To study & plot the Characteristics of MOSFET
4. To study & plot the finding characteristics of a Silicon Controlled rectifier.
5. To study and plot V-I characteristics of U.I.T.
6. Experiment on Various clipper & clamper circuit
7. Experiment on Various clipper & clamper circuit
8. To study & plot the input output characteristics of Transistor CB, CC,CE, mode

B.E.CBGS III SEMESTER
NETWORK ANALYSIS

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Network Analysis	EC3004	Min. "D"	Min. "D"	5.0

Unit –I:

Transient and steady state analysis of first order system, response of RL, RC system for different input signal.

Unit –II:

Transient and steady state analysis of second order system, Response of LC, RLC system for different input signal.

Unit – III:

Laplace Transformation and its Application in Circuit Analysis Fourier series: Introduction, exponential form, trigonometry form, symmetry in Fourier series, frequency spectrum amplitude spectrum.

Unit – IV:

Two Port Network Analysis Introduction, network element, classification of network, network configuration, recurrent network, zparameter, y parameter, h parameter, ABCD parameter.Condition of reciprocity and symmetry, inter- relationships, interconnections, image impedances.

Unit – V:

Synthesis: Concept of stability of system (polynomial ratio) from pole zero concept,Hurwitz polynomials, properties of Hurwitz polynomials. Concept of network synthesis, procedure of synthesis, LC network synthesis, foster's canonic form, cauer canonic form of reactive network, application of foster and cauer forms.

Books References:

1. M.E. Vanvalkenburg "Network Analysis" Prentice Hall .
2. M.E. Vanvalkenburg "Network Synthesis " John Wiley & sons

NETWORK ANALYSIS LAB

List of Experiments:

1. To verify the operation of parallel resonance RLC circuit and measurement of resonance frequency and bandwidth.
2. To verify the operation of series resonance RLC circuit and measurement of resonance frequency and bandwidth.
3. To verify the frequency characteristics of high pass RC circuit.
4. To verify the frequency characteristics of low pass RC circuit.
5. To study of Y parameters & Z parameters of two port T network.
6. To study of network theorems in AC circuit
7. The venin's b. Norton's c. Superposition
8. To study of network functions.

B.E.CBGS III SEMESTER
SIGNAL AND SYSTEMS

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Signal and Systems	EC3005	Min. "D"	Min. "D"	5.0

Unit -I: Signals and Systems. :

Signals: Classification of signals, Continuous-Time and Discrete-Time Signals, Periodic and A periodic, Even and Odd, Causal and Non-Causal, Deterministic and Random, Energy and power signals, Energy Theorem, Power Theorem, Cross correlation ,auto-correlation, ESD, PSD, Singularity Functions.

Systems: Classification of System and Basic System Properties, System with & without memory, inevitability& inverse system, Causality, Stability, Time-Invariance, Linearity.LTI system: Response, Convolution Integral, Properties & Eigen Function of LTI system, System described by difference and differential equation.

Unit - II: Fourier analysis of Signals:

Fourier series: Fourier series representation of Continuous-Time periodic signals, convergence & properties of Continuous-Time Fourier series, Fourier series representation of Discrete-Time periodic signals, properties of Discrete-Time Fourier series, Fourier series and LTI systems

Fourier transforms: Representation of A periodic signals, Continuous-Time Fourier transform, Discrete-Time Fourier transform, Spectrum plot, Fourier transform of periodic signal, Properties and Applications of Fourier transform(Hilbert transform), Frequency Response of LTI Systems.

Unit -III: Sampling:

Sampling theorem, Reconstruction of original signals from its samples, Alising, Anti-alising, Interpolation, Sample & Hold Circuit, MultiMate Sampling, Sampling of band-pass signals, Discrete-time processing of Continuous-time Signals, Sampling of discrete time signals.

Unit – IV: Z-Transform:

Z-Transform, Region of Convergence, Inverse Z-Transform, Properties of Z-Transform, Applications of Z-Transform, Analysis and Characteristic of LTI Systems using Z-Transform, System Function Algebra and Block Diagram Representation, Unilateral Z-Transform.

Unit -V : Laplace Transform :

Laplace transform, Region of Convergence, Inverse Laplace Transform, Properties of Laplace Transform, Applications of Laplace Transform, Laplace Transform of Some Common Signals, Unilateral Laplace transform, Relation between different transforms.

Books References:

1. Oppenheim, Willsky and Nawab: Signals and Systems, PHI
2. Simon Haykins, B.V.Vean: signals and systems, John Wiley & Sons, Inc.
3. H. P. Hsu: Schaum's Outline of Signals & Systems, MGH
4. David McMahon: Signals and Systems demystified, MGH
5. B.P.Lathi: Linear Systems &.Signals, Oxford Series

B.E.CBGS III SEMESTER
PROGRAMMING – I (PROGRAMMING IN C++)

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	Programming – I (Programming in C++)	CS3106	Min. "D"	Min. "D"	5.0

Unit I: Fundamental Concepts of Object-Oriented Programming (OOP):

Object, Class, message passing, abstraction and data hiding, encapsulation, modularity, inheritance, and polymorphism. Difference between Procedure Oriented Programming and Object Oriented Programming.

Unit II: Beginning With C++:

What is C++, Difference between C and C++, Classes and Objects in C++, defining classes, access specifier (i.e. Private, public, protected), defining member functions, creating objects of a class, access to member variables from objects etc. Friend functions and inline functions. Different types of function calls: call by value, call by address and call by Reference.

Unit III: Static Data Members, Constructor and Destructor in C++:

Default constructor, parameterized constructors and copy constructs.

Unit IV: Inheritance in C++:

Introduction, types of inheritance: single inheritance, multiple inheritance, multilevel inheritance, hierarchical inheritance and hybrid inheritance. Abstract class and Virtual base class.

Unit V: Polymorphism in C++:

Types of polymorphism, function overloading, operator overloading. Function overriding:- introduction to pointers, pointers to objects, this pointer, pointers to derived class, virtual functions, pure virtual function.

Books Reference:

1. Object Oriented Programming with C++ by E Balagurusamy, TMH.
2. Object Oriented Programming in C++ by Robert Lafore, Sams publishing.
3. Object Oriented Programming with C++, A. K. Sharma, Pearson.

PROGRAMMING – I (PROGRAMMING IN C++)

List of Experiments:

1. Write a C++ program to find the largest of three numbers using inline function.
2. Write a C++ program to sort an array of integer in ascending order using a function called exchange( ) which accepts two integer arguments by reference.
3. Create a class 'COMPLEX' to hold a complex number. Write a friend function to add two complex numbers. Write a main function to add two COMPLEX objects.
4. Write a C++ program to illustrate multiple inheritance.
5. Write a C++ program to illustrate 'this' pointer and pointers to derived classes.

6. Create a base class called 'SHAPE' having – two data members of type double – member function get-data( ) to initialize base class data members – pure virtual member function display – area( ) to compute and display the area of the geometrical object. Derive two specific classes 'TRIANGLE' and 'RECTANGLE' from the base class .Using these three classes design a program that will accept dimension of a triangle / rectangle interactively and display the area
7. Write a C++ program that uses function using overloaded functions
    a) To swap two integers,
    b) To swap two characters ,
    c) To swap two real numbers.
8. Write a C++ program to illustrate the use of overloaded constructor.
9. Write a C++ program to overload unary and binary operator, using a simple example.
10. Write a C++ program to calculate marks of postgraduate and graduate students using virtual function.
11. Write a C++ program to illustrate the use of static member function.