

**BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
IN FACULTY OF SCIENCE& TECHNOLOGY)
TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM**

III - SEMESTER B.E.(COMPUTER TECHNOLOGY)

Course Code	Course Title	Teaching Scheme				Examination Scheme										
		Hours per week			No. of Credits	Theory						Practical				
		L	T	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks			Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
								Sessional								
			ESE	MSE	IE		TW		POE							
3BECT01	Applied Mathematics – III	3	1	0	4	3	80	10	10	100	40	-	-	-	-	
3BECT02	Computer Architecture & Organization	3	1	0	4	3	80	10	10	100	40	-	-	-	-	
3BECT03	Advanced-C Programming	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
3BECT04	Electronic Devices & Circuits	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
3BECT05	Digital Circuits & Fundamentals of Microprocessor	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
3BECT06	Advanced-C Programming	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
3BECT07	Electronic Devices & Circuits	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
3BECT08	Digital Circuits & Fundamentals of Microprocessor	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
		15	2	9	23	-										
		26			23					500				150		
						650										

**BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
IN FACULTY OF SCIENCE& TECHNOLOGY)**

TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

IV- SEMESTER B.E.(COMPUTER TECHNOLOGY)

Course Code	Course Title	Teaching Scheme				Examination Scheme										
		Hours per week			No. of Credits	Theory						Practical				
		L	T	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks			Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
								Sessional								
			ESE	MSE	IE		TW		POE							
4BECT01	Applied Mathematics – IV	3	1	0	4	3	80	10	10	100	40	-	-	-	-	
4BECT02	Data Structures	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
4BECT03	Design Principles of Programming Languages	3	0	0	3	3	80	10	10	100	40	-	-	-	-	
4BECT04	Theory of Computation	3	1	0	4	3	80	10	10	100	40	-	-	-	-	
4BECT05	Object Oriented Methodologies	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
4BECT06	Data Structures	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
4BECT07	Object Oriented Methodologies	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
4BECT08	Programming-I	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
		15	2	9	23											
		26			23					500				150		
						650										

**BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
IN FACULTY OF SCIENCE& TECHNOLOGY)**

TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

V- SEMESTER B.E.(COMPUTER TECHNOLOGY)

Course Code	Course Title	Teaching Scheme				Examination Scheme										
		Hours per week			No. of Credits	Theory						Practical				
		L	T	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks			Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
								Sessional								
ESE		MSE	IE	TW	POE											
5BECT01	Advanced Data Structure	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
5BECT02	Design and Analysis of Algorithms	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
5BECT03	Java Programming	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
5BECT04	System Programming	3	0	0	3	3	80	10	10	100	40	-	-	-	-	
5BECT05	IDCC-I	3	0	0	3	3	80	10	10	100	40	-	-	-	-	
5BECT06	Advanced Data Structure	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
5BECT07	Design and Analysis of Algorithms	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
5BECT08	Java Programming	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
5BECT09	Seminar	0	0	3	2	-	-	-	-	-	-	50	-	50	25	
		15	0	12	23											
		27			23					500				200		
										700						

Seminar: A student is required to prepare an advanced technical topic of his/her area of interest from the stream and deliver before a seminar guide. Also he/she is required to submit seminar report.

**BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
IN FACULTY OF SCIENCE& TECHNOLOGY)**

TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

VI- SEMESTER B.E.(COMPUTER TECHNOLOGY)

Course Code	Course Title	Teaching Scheme				Examination Scheme									
		Hours per week			No. of Credits	Theory						Practical			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
								Sessional							
ESE	MSE	IE													
6BECT01	Web Technology	3	0	-	3	3	80	10	10	100	40	-	-	-	-
6BECT02	Computer Network & Communication	3	0	-	3	3	80	10	10	100	40	-	-	-	-
6BECT03	Software Engineering	3	0	-	3	3	80	10	10	100	40	-	-	-	-
6BECT04	Management Information System	3	0	0	3	3	80	10	10	100	40	-	-	-	-
6BECT05	IDCC-II	3	0	0	3	3	80	10	10	100	40	-	-	-	-
6BECT06	Audit Heads	0	0	0	5	Audit Course									
6BECT06	Web Technology	0	0	3	2	-	-	-	-	-	-	25	25	50	25
6BECT07	Computer Network & Communication	0	0	3	2	-	-	-	-	-	-	25	25	50	25
6BECT08	Software Engineering	0	0	3	2	-	-	-	-	-	-	25	25	50	25
6BECT09	Industry Exposure Program	0	0	0	2	-	-	-	-	-	-	50	-	50	25
		15	0	9	23										
		24			23					500				200	
										700					

Note: Industry Exposure Program for two weeks shall be required to be completed by every student by beginning of the semester.

**BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
IN FACULTY OF SCIENCE& TECHNOLOGY)**

TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

VII- SEMESTER B.E.(COMPUTER TECHNOLOGY)

Course Code	Course Title	Teaching Scheme				Examination Scheme										
		Hours per week			No. of Credits	Theory						Practical				
		L	T	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks			Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
								Sessional								
ESE	MSE	IE	TW	POE												
7BECT01	Operating System	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
7BECT02	Computer Graphics	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
7BECT03	Database Management System	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
7BECT04	Embedded System	3	0	0	3	3	80	10	10	100	40	-	-	-	-	
7BECT05	CE-I 1.Neural Network & Fuzzy Logic 2.Advanced Computer Architecture 3.Enterprise Resource Planning 4.Multimedia Systems	4	0	0	4	3	80	10	10	100	40	-	-	-	-	
7BECT06	Operating System	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
7BECT07	Database Management System	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
7BECT08	Major Project Literature Review & Presentation	0	0	3	4	-	-	-	-	-	-	25	25	50	25	
		16	0	9	24	-										
		25			24					500				150		
						650										

**BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
IN FACULTY OF SCIENCE& TECHNOLOGY)
TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM**

VIII- SEMESTER B.E.(COMPUTER TECHNOLOGY)

Course Code	Course Title	Teaching Scheme				Examination Scheme										
		Hours per week			No. of Credits	Theory						Practical				
		L	T	P		Duration of Paper (Hrs.)	Max. Marks	Max. Marks		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks	
								Sessional								
ESE	MSE	IE	TW	POE												
8BECT01	Compiler Construction	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
8BECT02	Data Warehousing and Data Mining	3	0	-	3	3	80	10	10	100	40	-	-	-	-	
8BECT03	CE-II 1.Cloud Computing 2.Digital Image Processing 3.TCP/IP 4.Soft Computing	4	0	0	4	3	80	10	10	100	40	-	-	-	-	
8BECT04	OE-I	2	0	0	2	3	80	10	10	100	40	-	-	-	-	
8BECT05	Compiler Construction	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
8BECT06	Data Warehousing and Data Mining	0	0	3	2	-	-	-	-	-	-	25	25	50	25	
8BECT07	Major Project	0	0	6	6	-	-	-	-	-	-	75	75	150	75	
		12	0	12	22											
		24			22					400					250	
						650										

INTER DISCIPLINARY CLUSTER COURSES

V – SEMESTER				VI - SEMESTER			
S.N.	COURSE TITLE	CODE	PARENT BOS	S.N.	COURSE TITLE	CODE	PARENT BOS
01			ELECTRICAL (EEE)	01			ELECTRICAL (EEE)
02			MECHANICAL	02			MECHANICAL
03			CIVIL	03			CIVIL
04			MINING	04			MINING
05			EN/ ECE/ EXTC	05			EN/ ECE/ EXTC
06	Cyber Security	5BECT05/5BECS05	CT/CSE	06	Internet & Web Technology	6BECT05/6BECS05	CT/CSE
07			INFORM. TECH.	07			INFORM. TECH.
08			INSTRUMENTATION	08			INSTRUMENTATION

LIST OF AUDIT COURSES/ EVENTS

01	Business Communication Skills	07	
02	Advanced Excel	08	
03		09	
04		10	
05		11	
06		12	

PROPOSED COURSES FOR OPEN ELECTIVE

01	Financial Management	04	Project Management & Quality
02	Foundation Course in HR Mgmt.	05	Cyber laws: International Perspective
03	Entrepreneur Development	06	Corporate Ethics

GONDWANA UNIVERSITY, GADCHIROLI
FACULTY OF SCIENCE AND TECHNOLOGY
CONSOLIDATED STATEMENT OF VARIOUS PARAMETERS IN TEACHING & EXAMINATION SCHEME OF
B.E. (COMPUTER TECHNOLOGY)

SR.NO.	SEMESTER	NO. OF THEORY COURSES	NO OF LABS/PRACT	TEACHING HOURS(TH) (L+T)	TEACHING HOURS (PRACT)	TOTAL CREDIT	MAX. THEORY MARKS	MAX.PRACT MARKS	MAX. MARKS TOTAL
1	III	5	3	17	9	23	500	150	650
2	IV	5	3	17	9	23	500	150	650
3	V	5	4	15	12	23	500	200	700
4	VI	5	4	15	9	23	500	200	700
5	VII	5	3	16	9	24	500	150	650
6	VIII	4	3	12	12	22	400	250	650
		29	20	92	60	138	2900	1100	4000

Course wise Board of Studies Affiliation

Board of Studies	Course Codes
APPLIED SCIENCES & HUMANITIES	3BECT01, 4BECT01
ELECTRONICS ENGINEERING	3BECT04, 3BECT05

CHOICE BASED CREDIT SYSTEM
III-Semester B. E. (Computer Technology)

Course Code: **3BECT01**

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
03	01	--	04	04	03	10	10	80	100

Unit	Contents	Hours
I	Z-Transform: Definition, Properties, Inverse by partial fractions and convolution theorem. Application of Z-Transform to solve differential equations with constant coefficients. Fourier Integers and Fourier Transforms.	11
II	Matrices: Inverse of Matrix by adjoint and partitioning method. Rank of Matrix and consistency of system of linear simultaneous equations. Linear dependence. Eigen Values and Eigen Vector, Reduction to diagonal form.	09
III	Matrices: Cayley-Hamilton Theorem, Sylvester's Theorem (statement only) . Solution of second order ordinary linear differential equations with constant coefficients by matrix method, Largest Eigen value and corresponding Eigen vector by iteration.	09
IV	Random Variables and Probability Distributions: Random variables discrete and continuous, Probability functions and distribution functions for discrete and continuous random variables, Joint distribution.	08
V	Mathematical Expectation: Mathematical expectation, Variance and Standard Deviation, Moments, Moment generating function, Coefficient of Skewness & Kurtosis.	08
Total		45

Text Book/s:

1. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers
2. Probability and Statistics by Murray R. Spiegel, Schaum's Outline Series.

Reference Book/s:

1. A Text Book of Engineering Mathematics by N.P.Bali and Manish Goyal, Laxmi Publications Pvt Limited, 2011

III-Semester B. E. (Computer Technology)

Course Code: **3BECT02**

Title of the Course: **Computer Architecture & Organization**

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	01	--	04	04	03	10	10	80	100

Unit	Contents	Hours
I	Basic Structure of Computer Hardware and Software: Functional Units, Basic Operational concepts, Bus Structures, Software, Distributed Computing. Addressing Methods and Machine Program Sequencing : Memory Locations, Addresses and Encoding of Information, Main Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly Language, Stacks, Subroutine.	9
II	The processing Unit: Some Fundamental Concepts, Execution of a complete Instruction, Sequencing of Control Signals. Computer peripherals : I/O Devices. Processors: Introduction to RISC Processors, Array Processors, Loosely coupled, Tightly coupled Systems.	9
III	Microprogrammed Control: Microinstructions, Grouping of control signals, Micro Program Sequencing, Micro instructions with next address field, Perfecting Microinstructions, Emulation, Bit Slices, Introduction to Microprogramming.	9
IV	Arithmetic : Number Representation, Addition of Positive Numbers, Logic Design for Fast Adders, Addition and Subtraction, Arithmetic and Branching Conditions, Multiplications of positive numbers, Signed – Operand Multiplication, Fast Multiplication.	9
V	The Main Memory: Some Basic Concepts, Semiconductor RAM Memories, Memory System Considerations, Semiconductor ROM Memories, Multiple module Memories and Interleaving, Cache Memories, Virtual Memories, Memory Management Requirements.	9
Total		45

Text Book/s:

1. V.CarlHamacher, Zvonko G. Varanesic and Safat G. Zaky, “ Computer Organization“, V edition, McGraw-Hill Inc, 1996.Organisation“, V edition, McGraw-Hill Inc, 1996.
2. Computer Organization & Architecture 7e By william Stallings PHI, edition

Reference Book/s:

1. Computer System architecture: M. Morris Mano PHI, edition

III-Semester B. E. (Computer Technology)

Course Code: 3BECT03

Title of the Course: Advanced-C Programming

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	00	--	03	03	03	10	10	80	100

Unit	Contents	Hours
I	Introduction to Problem Solving: Flow charts, Tracing flow charts, Problem solving methods, Need for computer Languages, C Language preliminaries: C character set, Identifiers and keywords, Data types, Declarations, Expressions, statements and symbolic constants , Operators and expressions: Arithmetic, unary, logical, bit-wise, assignment and conditional operators, Control statements: While, do-while, for statements, nested loops, if else, switch, break, Continue, and goto statements, comma operators .	09
II	Storage types: Automatic, external, register and static variables. Functions: Defining and accessing, passing arguments, Function prototypes, Recursion, Library functions, Static functions. Arrays: Defining and processing, Passing arrays to a function, Multi-dimensional arrays.	09
III	Strings: Defining and handling of strings, operations on strings. Pointers: Declarations, Passing pointers to a function, Operations on pointers, Pointer Arithmetic, Pointers and arrays, Arrays of pointers function pointers.	09
IV	Structures: Defining and processing, Passing to a function, Unions, typedef, array of structure, and pointer to structure. Dynamic Memory Allocation.	09
V	File structures: Definitions, concept of record, file operations: Storing, creating, retrieving, updating Sequential, relative, indexed and random access mode, Files with binary mode(Low level), performance of Sequential Files, Direct mapping techniques: Absolute, relative and indexed sequential files (ISAM) concept of index, levels of index, overflow of handling. File Handling: File operation: creation, copy, delete, update, text file, binary file. Combining Command-line Arguments and File I/O.	09
Total		45

Text Book/s:

1. Teach Yourself C by Herbert Schildt , 3rd edition, Tata McGraw Hill
2. C : The Complete reference , by Herbert Schildt , 4th edition, Tata McGraw Hill
3. C – programming by E.Balagurusamy, Tata McGraw Hill

Reference Book/s:

1. Let Us C by Y. kanetkar, BPB Publication.
2. Mastering C by K R Venugopal& Prasad, Tata McGraw Hill

III-Semester B. E. (Computer Technology)

Course Code:

3BECT04

Title of the Course: Electronic Devices & Circuits

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	00	--	03	03	03	10	10	80	100

Unit	Contents	Hours
I	Semiconductor Devices and Applications: Diode as a Half Wave Rectifier, Full Wave Rectifier, Breakdown in diodes, Zener and Avalanche Mechanism, Voltage regulator using Zener Diode, Characteristics of BJT, Biasing of BJT, Fixed Bias, Collector to Base Bias, Self Bias, Stability Factor, Thermal Runaway, Thermal compensation	11
II	Small Signal Analysis of BJT: Two Port Network, H Parameters, Small Signal Analysis of CB, CE & CC Amplifiers, Millers Theorem, High Input Impedance Circuits, Bootstrapping	9
III	Power Amplifiers: Classification of amplifiers, Class A, Class B, Class AB, Push pull Configuration, Complementary Symmetry, Harmonic Distortion, Cross Over Distortion	8
IV	Oscillators: Feedback Topologies, Voltage Shunt, Voltage Series, Current Shunt & Current Series Feedback, Barkhausen Criterion, Hartley, Colpitt, RC Phase Shift, Wein Bridge & Crystal Oscillator.	8
V	FET and its Analysis: JFET: Principle of Operation, Characteristics, Biasing, Small signal Analysis of CG, CS, & CD amplifiers, MOSFET: Principle of Operation, Characteristics, Enhancement Type, Depletion Type MOSFET	9
Total		45

Text Book/s:

1. Electronic Devices and Circuits –Millman and Halkias, Mc Graw Hill
2. Integrated Electronics -Jacob Millman and Christos C. Halkias,Mc Graw Hill

Reference Book/s:

1. Electronic Devices and Circuits- Allen Mottershead .Gale Group, 1992
2. Electronic Devices and Circuits-S.Salivahanan and N.Suresh Kumar, Tata McGraw-Hill Education, 2011

III-Semester B. E. (Computer Technology)

Course Code: 3BECT05

Title of the Course: Digital Circuits & Fundamentals of Microprocessor

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	00	--	03	03	03	10	10	80	100

Unit	Contents	Hours
I	Number systems, Boolean Algebra, Basic logic circuits, truth tables, Demorgan's law, basic combinational logic circuits and design, sum of product and product of sum, simplification using K-maps, SSI, MSI, LSI & VLSI circuit classification.	09
II	Combinational Logic : Decoders, Encoders, Multiplexers, Demultiplexers, Code converters, Parity circuits and comparators, Arithmetic modules- Adders, Subtractions (Half and Full), BCD adder/subtractor, ALU.	09
III	Basic sequential circuits- latches and flip-flops: SR-flipflop, D-flipflop, JK flip-flop, T flip-flop, Timing hazards, Race around Condition, J-K Master Slave Flip flop. Excitation tables of Flip Flops, Conversion of one type flip-flop to another type flips flop, Counters, types of Counters, Design of Mod N counters Using K-map, Lock Free Counters, Up down Counter.	09
IV	Introduction to 8085 microprocessor, architecture, instruction set, Timing diagrams, Flags, addressing modes, Assembly language programming, interrupts.	09
V	Memory organization & interfacing. Interfacing I/O devices PPI 8255, 8253, and its organization & interfacing with 8085.	09
Total		45

Text Book/s:

1. Digital Design by Morris Mano Prentice-Hall, 2007
2. Fundamental of Digital Electronics: A. Anand Kumar.
3. Microprocessor Architecture Programming & Applications with the 8085 by Ramesh Gaonkar

Reference Book/s:

1. Digital Electronics 3rd Edition 2003 by R.P.Jain TATA McGraw-Hill.
2. Digital circuit & design: A. P. Godse.
3. Microprocessor Techniques by A. P. Godse. Technical Publication.

III-Semester B. E. (Computer Technology)

Course Code: 3BECT06

Title of the Course: **Advanced- C Programming**

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
--	--	01	03	02	25	25	50

List of Practicals	
	The student is expected to perform 10 practicals based on following topics.
I	Practical no. 1 & 2 should be based on the basic control structures of C-language.
II	Practical no. 3 should be based on to demonstrate the use of Storage types & Functions.
III	Practical no.4 should be based on Multidimensional Arrays.
IV	Practical no.5 should be based on handling of Strings.
V	Practical no.6 should be based on the use of Pointers.
VI	Practical no.7 should be based on the use of Structures.
VII	Practical no.8 should be based on to demonstrate Dynamic Memory Allocation
VIII	Practical no.9 & 10 should be based on File handling.

III-Semester B. E. (Computer Technology)

Course Code: **3BECT07**

Title of the Course: Electronic Devices & Circuits

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
--	--	01	03	02	25	25	50

List of Practicals	
I	Study of half wave rectifier
II	Study of full wave rectifier
III	Study of Bridge rectifier
IV	Study of characteristics of Zener diode
V	Study of characteristics of BJT
VI	Study of frequency response of CE amplifier
VII	Study of push-pull amplifier
VIII	Study of phase shift oscillator
IX	Study of negative feedback amplifiers
X	Study of H parameters

III-Semester B. E. (Computer Technology)

Course Code: 3BECT08

Title of the Course: Digital Circuits & Fundamentals of Microprocessor

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
--	--	01	03	02	25	25	50

List of Practicals	
	The student is expected to perform 10 practicals based on following topics.
I	Practical no. 1 & 2 should be based on logic gates, de Morgan's laws.
II	Practical no. 3 should be based on Combinational circuits like Adder, Subtractor, Encoders, Decoders, Multiplexers and De-multiplexers.
III	Practical no.4 should be based Sequential Circuits like flip-flops, Counters, Registers.
IV	Practical no.5, 6, 7 should be based on instruction set of 8085 using instructions such as Arithmetic instructions and data transfer instructions.
V	Practical no. 8 should be based on the use of Stack instruction (PUSH, POP).
VI	Practical no.9, 10 should be based on Logical and Branching instructions.

IV-Semester B. E. (Computer Technology)

Course Code: 4BECT01

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
03	01	--	04	04	03	10	10	80	100

Unit	Contents	Hours
I	Set Theory: Basic Concepts of set theory, The power set, Some operations on sets, Venn diagram, Basic set identities, Cartesian product, Properties of binary relation in a set, Matrix and the Graphs of a relation, Equivalence relation, Partial order relation, comp ability, Composition of binary relation, Function, Composition of functions, Inverse Functions, Characteristics Function of a set.	09
II	Mathematical Logic: Statements Connectives: Negotiation, Conjunction, Disjunction, Conditional and biconditional, statement formulas and truth table. Tautologies, Equivalence of formulas, Duality laws, Tautological implication. Theory of inference for statement calculus, Theory of inference for Predicate calculus.	09
III	Algebraic Structures: Semigroups and Monoids, Groups (definitions and examples) Cyclic groups, Permutation groups, subgroups and Homomorphisms. Cosets and Lagranges theorem, Normal subgroups, Rings (definition and examples), subrings, Ring Homomorphisms, Ideals and Quotient Rings, Polynomial Ring, finite fields and integral domain.	09
IV	Lattice Theory & Boolean Algebra: Lattices as partial ordered set (definition and examples), some problems of lattices as algebraic system, Sub lattices, Direct Product, Homomorphism, Some special lattices, Boolean algebra (definition and examples), application to switching circuits.	09
V	Graph Theory: Basic concepts of Graph Theory, Basic definitions, Paths, Rechability and connectedness, Matrix representation of Graphs, Trees, Tree Searching, Undirected Trees, Minimal Spanning Trees.	09
Total		45

Text Book/s:

1. Discrete Mathematics Structures with application to Computer Science by J.P.Trembly& R. Manohar
2. Discrete Maths for Computer Scientists & Mathematicians (Chapter 2,5,7) by J.L.Mott, A. Kandel, T.P.Baker

3. Discrete Mathematics by J.K.Sharma, Macmillan **Publishers** India

Reference Book/s:

1. Elements of Discrete Mathematics by C.L.Liu., Tata McGraw-Hill, 2008.
2. Discrete Mathematics by Lipschutz, McGraw Hill Professional, 2007
3. Discrete Mathematics by R. Johnsonbaugh., 9th edition, John Wiley & Sons, 2006

IV-Semester B. E. (Computer Technology)

Course Code: 4BECT02

Title of the Course: Data Structures

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	00	--	03	03	03	10	10	80	100

Unit	Contents	Hours
I	Introduction to Data Structures: Basic Concepts of Data, How to Create programs. Arrays: Ordered Lists, Sparse Matrices, Quick Sort, Merge Sort, Heap Sort, selection & Bubble Sort, Linear Search, Binary Search.	09
II	Stacks & Queues: Fundamentals, Evaluation of expressions, Polish expressions & their compilation, Application of stacks, Multiple stacks & Queues, Priority queues.	09
III	Linked Lists: Singly Linked List, Linked Stacks & Queues, the polynomial addition, Examples on linked list, circular linked list, doubly linked list & dynamic storage management, Generalized list.	09
IV	Trees: Basic Terminology, Basic trees, Binary tree representations, threaded storage representation, binary tree traversals, binary search trees, Application of trees. Preliminary treatment of AVL Trees, B-Trees, Tries.	09
V	Graphs: Definition & terminology, Graph representation : matrix representation of Graph, List of structure, other representation of graphs, Breadth First Search, Depth First Search, Spanning trees, Shortest path algorithm, topological sorting, Critical path.	09
Total		45

Text Book/s:

1. Fundamentals of Data Structures by Horowitz & Sahani, Galgotia Publications, 1999
2. Algorithms, Data Structures & Programs by Ni Claus Worth, Printice Hall ltd
3. Data Structures in C/C++ by Tananbaum, Tata McGraw Hill
4. An introduction to Data Structures with Applications by Trembley & Sonerson, Tata McGraw Hill

Reference Book/s:

1. Data Structure & Program design in C by Kruse, Leung & Tondo, PHI
2. Data Structure Through C, BPB Pub.

IV-Semester B. E. (Computer Technology)**Course Code: 4BECT03**

Title of the Course:

Design Principles of Programming Languages

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	00	--	03	03	03	10	10	80	100

Unit	Contents	Hours
I	Languages Design Issues: Why Study Programming Languages, Role of Programming Languages, Programming Environment, Impact of Machine Architectures: Operations of a Computer, Virtual Computers and binding times. Language Translation Issues: Programming Language Syntax, Stages in translation	10
II	Elementary Data types: Properties of Types & objects, Scalar data types, Composite Data types.	08
III	Encapsulation: Structured data types, Abstract data types, Encapsulation by subprograms, Type definition. Inheritance, Polymorphism.	09
IV	Sequence Control: Implicit and Explicit Sequence Control, Sequencing with arithmetic expressions, Sequence control between statements, sequencing with non-arithmetic statements, Subprogram Control: Subprogram Sequence Control, Attributes of data control, parameters transmission.	09
V	Storage Management: Elements requiring storage, programs & system controlled storage, static storage management, Distributed Processing :- Variations in subprogram control, Parallel programming.	09
Total		45

Text Book/s:

1. Programming Languages: Design and Implementation by Terrance W. Pratt, Marvin V. Zelkowitz & T.V. Gopal (Pearson Education)
2. Programming Languages: Paradigm and Practice by Doris Appleby & Julius J. VandeKopple (Tata McGraw-Hill Edition)

Course Code: 4BECT04
Title of the Course: Theory of Computation

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	01	--	04	04	03	10	10	80	100

Unit	Contents	Hours
I	Introduction to formal proof – Additional forms of proof – Inductive proofs – Introduction:alphabets,Strings and Language:automata and Grammars Finite Automata (FA) – Deterministic Finite Automata (DFA)– Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.	9
II	Regular expressions(RE)-Defination,FAandRE,REtoFA,FAtoRE,algebraic laws for RE,application of Res,Regular grammars and FA,FA for regular grammar,Regular grammar for FA,Pumping Lemma..	9
III	Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata.	9
IV	Normal forms for CFG – Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines – Programming Techniques for TM.	9
V	A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing Machine – Post’s Correspondence Problem - The classes P and NP.	9
Total		45

Text Book/s:

1. J.E.Hopcroft, R.Motwani and J.D Ullman, “Introduction to Automata Theory, Languages and Computations”, Second Edition, Pearson Education, 2003.

Reference Book/s:

1. H.R.Lewis and C.H.Papadimitriou, “Elements of The theory of Computation”, Second Edition, Pearson Education/PHI, 2003
2. J.Martin, “Introduction to Languages and the Theory of Computation”, Third Edition, TMH, 2003.
3. MichealSipser, “Introduction of the Theory and Computation”, Thomson Brokecole, 1997.

IV-Semester B. E. (Computer Technology)

Course Code:

4BECT05

Title of the Course:

Object Oriented Methodologies

Course Scheme					Evaluation Scheme (Theory)				
Lecture	Tutorial	Practical	Periods/week	Credits	Duration of paper, hrs	MSE	IE	ESE	Total
03	00	--	03	03	03	10	10	80	100

Unit	Contents	Hours
I	Object oriented paradigm: Basic terms and ideas, Objects & Classes in C++ : Declaring & using classes, cin, cout operators. Constructors, Objects as functions arguments, Copy constructor, Static class data. Array of objects.	09
II	Encapsulation, information hiding, abstract data types, C++ garbage collection, dynamic memory allocation, new, delete operators. Pointers & arrays. Pointers & functions. Pointers for objects. Operator overloading : Overloading unary & binary operators. Data conversion. Pitfalls of operator overloading.	09
III	Inheritance in C++ : Derived class & base class, Derived class constructors, Function overloading, class hierarchies, Public and private inheritance, Multiple inheritance. Containership : classes within classes.	09
IV	Virtual functions concepts, Abstracts classes & pure virtual functions. Virtual base classes, Friend functions, Static functions, Assignment and copy initialization, the this pointer. Dynamic type information.	09
V	Streams & Files in C++ : Stream classes, stream errors, disk file I/O with streams, File pointers, Error handling in file I/O. File I/O with members functions, overloading the extractions & insertion operators, Memory as a stream object, command line arguments. Function Template, Class templates, Exception syntax, Multiple exceptions, exception with arguments.	09
Total		45

Text Book/s:

1. Object-Oriented Programming in C++ by Robert Lafore,GalgotiaPublishing
2. C++ : Complete Reference by Herbert Schildt,TMH

Reference Book/s:

1. C++ Programming Language by Bjarne Stroustrup,Addison-Wesley
2. Mastering C++ by Venugopal ,TMH
3. C++ Primer by Lipmann, Addison-Wesley.

IV-Semester B. E. (Computer Technology)

Course Code: 4BECT06
Title of the Course: Data Structures

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
--	--	01	03	02	25	25	50

List of Practicals	
I	1 ^s & 2 nd Practical should be based on Arrays and Searching & Sorting techniques resp.
II	3 rd & 4 th Practical should be based on Stacks & Queues.
III	5 th & 6 th Practical should be based on Linear & Circular Linked list resp.
IV	7 th & 8 th Practical should be based on Trees
V	9 th & 10 th Practical should be based on Graphs.

Course Code:

4BECT07

Title of the Course:

Object Oriented Methodologies

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
--	--	01	03	02	25	25	50

List of Practicals	
	Practical's of Object Oriented Methodologies shall be written in C++ programming language and shall be based on syllabus.
I	Practical 1 and 2 shall be based on implementation and demonstration of Class, objects, constructor and destructor and copy constructors.
II	Practical 3 and 4 shall be based on implementation of data structures Stacks and link list.
III	Practical 5 and 6 shall be based on implementation and demonstration of operator overloading using member function and friend function.
IV	Practical 7 and 8 shall be based on implementation and demonstration of concept of inheritance and multiple inheritance.
V	Practical 9 shall be based on implementation and demonstration of concept of virtual function.
VI	Practical 10 shall be based on implementation and demonstration of concept of Generic function and Generic classes and use of function templates.

Course Code: 4BECT08

Title of the Course: Programming-I

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
--	--	01	03	02	25	25	50

List of Practicals	
I	1 st , 2 nd and 3 rd practical should be on HTML commands.
II	4 th , 5 th and 6 th practical should be on PHP commands.
III	7 th practical should be on UNIX basic commands.
IV	8 th practical should be on UNIX communication commands.