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.(INFORMATION 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 (Sessional)		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
							ESE	MSE	IE			TW	POE		
3BEIT01	**Applied Mathematics III**	3	1	0	4	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
3BEIT02	**Computer Architecture & Organization**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
3BEIT03	**Data Structure**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
3BEIT04	**Digital Circuit & Fundamentals of Microprocessor**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
3BEIT05	**Basic Electronics**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
3BEIT06	**Data Structure**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
3BEIT07	**Digital Circuit & Fundamentals of Microprocessor**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
3BEIT08	**Basic Electronics**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
		15	5	06	22	-				500				150	

BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
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IV - SEMESTER B.E.(INFORMATION 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 (Sessional)		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
							ESE	MSE	IE			TW	POE		
4BEIT01	**Applied Mathematics IV**	3	1	0	4	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
4BEIT02	**Theory Of Computation**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
4BEIT03	**Object Oriented Programming**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
4BEIT04	**System Programming**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
4BEIT05	**Principles Of Communication**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
4BEIT06	**Object Oriented Programming**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
4BEIT07	**Principles Of Communication**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
4BEIT08	**Software Technology Lab-I**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
		15	5	06	22	-				500				150	

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V - SEMESTER B.E.(INFORMATION 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 (Sessional)		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
							ESE	MSE	IE			TW	POE		
5BEIT01	**Operating System**	3	1	0	4	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
5BEIT02	**Java Programming**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
5BEIT03	**Design & Analysis Of Algorithms**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
5BEIT04	**Microprocessor & Microcontroller**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
5BEIT05	**IDCC-I**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
5BEIT06	**Java Programming**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
5BEIT07	**Microprocessor & Microcontroller**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
5BEIT08	**Seminar**	0	0	2	2							**50**		50	
		15	5	06	22	-				500				150	

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VI - SEMESTER B.E.(INFORMATION 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 (Sessional)		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
							ESE	MSE	IE			TW	POE		
6BEIT01	**Database Management System**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
6BEIT02	**Software Engineering**	3	1	0	4	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
6BEIT03	**Web Technology**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
6BEIT04	**Professional Management Information System**	3	1	0	4	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
6BEIT05	**IDCC-II**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
6BEIT06	**Audit Course**	0	0	0	5	0	**-**	**-**	**-**	-	-	**-**	**-**	-	-
6BEIT07	**Database Management System**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
6BEIT08	**Web Technology**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
6BEIT09	**Industrial Training**	0	0	2	2							**50**		50	25
		15	5	06	23	-				500				150	

BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
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TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

VII - SEMESTER B.E.(INFORMATION 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 (Sessional)		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
							ESE	MSE	IE			TW	POE		
7BEIT01	**Computer Networks**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
7BEIT02	**Software Testing and Quality Assurance**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
7BEIT03	**Data Mining & Data Warehousing**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
7BEIT04	**Wireless Communication**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
7BEIT05	**Core Elective-I** **1) Advanced Computing Techniques** **2)Information Retrieval System** **3) Embedded Systems** **4) Software Testing**	3	1	0	4	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
7BEIT06	**Computer Networks**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
7BEIT07	**Wireless Communication**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
7BEIT08	**Project Phase -I**	0	0	2	4	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
		15	5	06	24	-				500				150	

BACHELOR OF ENGINEERING (FOUR YEARS DEGREE COURSE
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TEACHING AND EXAMINATION SCHEME WITH CHOICE BASED CREDIT SYSTEM

VIII - SEMESTER B.E.(INFORMATION 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 (Sessional)		Total	Min. Passing Marks	Max. Marks	Max. Marks	Total	Min. Passing Marks
							ESE	MSE	IE			TW	POE		
8BEIT01	**Compiler Design**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
8BEIT02	**Soft Computing Techniques**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
8BEIT03	**TCP/IP**	3	1	0	3	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
8BEIT04	**Core Elective-II** **1) Optimization Techniques** **2) Natural Language Processing** **3) Web Data Management** **4) Information Security System**	3	1	0	4	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
8BEIT05	**Open Electives-I**	3	1	0	2	3	**80**	**10**	**10**	100	40	**-**	**-**	-	-
8BEIT06	**Compiler Design**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
8BEIT07	**Soft Computing Techniques**	0	0	2	2	-	**-**	**-**	**-**	-	-	**25**	**25**	50	25
8BEIT08	**Project Phase -II**	0	0	2	6	-	**-**	**-**	**-**	-	-	**75**	**75**	150	25
		15	5	06	25	-				500				250	

UNIQUE CODE NOMENCLATURE TECHNIQUE

(Explained with respect to above nomenclature)

Example : 1BEAB007

- **It consist of FOUR parts, as explained below.**

1	BE	AB	007
Semester Number	Bachelor of Engineering	All Branches	Serial Code in that semester

CODES FOR VARIOUS BRANCHES OF ENGINEERING (UG)

01	Civil Engineering	CE
02	Electronics & Power Engineering	EP
03	Electrical Engineering	EE
04	Electronics Engineering	EX
05	Electronics & Communication Engineering	EC
06	Electronics & Telecommunication Engineering	ET
07	Mechanical Engineering	ML
08	Mining Engineering	MN
09	Computer Science & Engineering	CS
10	Computer Technology	CT
11	Instrumentation Engineering	IE
12	Information Technology	IT

(So, for example, with respect to fourth semester electronics and telecommunication engineering and sequence subject number 005, the complete subject code will be 4BEET005.)

UNIFORMITY TO BE MAINTAINED WHILE DESIGNING SCHEME OF TEACHING & EXAMINATION

(I) The Examination scheme of any two or more examinations should not be exactly similar.

(II) There will be total of 185 credits. (total of all eight semesters)

(III) As 47 credits have already been allotted in I and II Semesters, remaining credits (185-47 = 138) shall be divided equally among all remaining six semesters, as far as possible.

(IV) The subjects shall be categorized under following heads :

(a) Fundamental
(b) Core Compulsory
(c) Inter Disciplinary Cluster Course(IDCC)
(d) Core Elective
(e) Open Elective

(V) A subject designated as IDCC – I shall be placed at the V Semester level, in all the branches. (3 credits)

(VI) A subject designated as IDCC – II shall be placed at the VI Semester level, in all the branches.(3 credits)

(VII) A Subject designated as Core Elective – I (CE – I) shall be placed at the VII Semester level, in all the branches. (4 credits)

(VIII) A subject designated as Core Elective – II (CE – II) shall be placed at the VIII Semester level, in all the branches. (4 credits)

(IX) A subject designated as Open Elective – I (OE – I) shall be placed at the VIII Semester level, in all the branches. (2 credits)

(X) Industrial Training/ Industry Exposure Program for two weeks shall be required to be completed by every student by the beginning of VI Semester, so that its evaluation can be done in VI Semester examination. The evaluation will be only on Internal (50 marks) evaluation basis, with total of 2 credits. Minimum pass marks shall be 25 only.

(XI) There will be seminar at V semester level, as far as possible, which will be evaluated only on internal (50 marks) evaluation basis, with total of 2 credits. Minimum pass marks shall be 25 only.

(XII) There will be seminar at V semester level, as far as possible, which will be evaluated only on internal (50 marks) evaluation basis, with total of 2 credits. Minimum pass marks shall be 25 only.

(XIII) There will be 'Minor Project/ Major Project Literature Review & Presentation' at VII semester level, as far as possible, which will be evaluated on internal & external (25 marks each) evaluation basis, with total of 4 credits. Minimum pass marks shall be 25 only.

(XIV) There will be 'Major Project' at VIII semester level, as far as possible, which will be evaluated on internal & external (75- marks each) evaluation basis, with total of 6 credits. Minimum pass marks shall be 25 only.

III Semester B. E. (Information Technology)

Course Code: **3BEIT01**
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
3	1	0	4	4	3	10	10	80	100

Unit	Contents	Hours
I	Definition, Properties, Inverse by partial fractions and convolution theorem, Application of Z-Transform to solve difference equations with constant coefficients.Fourier Integras and Fourier Transforms.	9
II	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.	9
III	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.	9
IV	Random Variables discrete and continuous, Probability functions and distribution functions for discrete and continuous random variables, Joint distribution.	9
V	Mathematical expectation, Variance and standard deviation, Moments, Moment generating function Coefficient of Skewness & Kurtosis.	9
	Total	45

Text Book/s:

1. Higher Engineering Mathematics by B.S.Grewal
2. Probability and Statistics by Murray R Spiegel

Reference Book/s:

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

Course Code: **3BEIT02**

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

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	**Basic Structure of Computer Hardware and Software**: Non von Neumann architecture , Functional Units, Basic Operational Concepts, Bus Structures, Software , Distributed Computing, addressing methods and machine program sequencing : Memory Locations , addressing and encoding of information, Main memory operation , Instructions and Instruction sequencing, addressing modes, Assembly language, Design of Assembler, Stacks, Subroutine, Instruction Sets: Instruction Format, limitations of Short word- length machines, High level language considerations, Motorola 68000 architecture	9
II	**The Processing Unit:** , ,Some fundamental concepts, bus architecture Execution of complete instruction, Hardwired control, Performance consideration, Micro programmed control, microinstruction format, microinstructions, Microprogram sequencing, bit slice concept. Introduction to Microprogramming, Macro Processor.	9
III	**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, Booth's Algorithm, Integer Division, Floating point numbers and operations	9
IV	**The main Memory:** some basic concepts, semiconductor RAM memories, Memory system consideration, semiconductor ROM memories, Multiple module memories and interleaving, Cache Memory, Mapping techniques, Virtual memories, memory management requirements , replacement algorithms	9
V	**Computer Peripherals:** I/O Devices, DMA, Interrupt handling, Online storage, File services. Processors: Families of microprocessors Chips, Introduction to RISC & CISC Processors, Introduction to Pipelining, basic concepts in parallel processing & classification of parallel architectures, VLIW processor architectures.	9
	Total	45

Text Book/s:

1. Computer Organization 4th ed.: Hamacher, Carl V. et al, MGH.
2. Structured Computer Organization: Tanenbaum A. S, Prentice Hall of India Ltd.

Reference Book/s:

1. Computer Architecture & Organization 3rd ed: J.P.Hayes, MGH.
2. Computer Organization and Architecture 8th ed: Designing for Performance, William Stallings.

Course Code: **3BEIT03**

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
3	1	0	4	3	3	10	10	80	100

Unit	Contents	Hours
I	Basics: Data structure and its types, DS operations- insertion, deletion, traversing, searching, linear arrays and their representation in memory. Insertion, deletion and traversing in array. Sorting and searching techniques-insertion sort, selection sort, merge sort, radix sort, bubble sort, sequential search, and binary search.	9
II	Linked lists (singly linked list, doubly linked list, circular linked list) and their representation in memory, traversing a linked list, searching a linked list. Memory allocation & garbage collection. Insertion deletion operations on linked lists. Header linked lists, Two- way linked lists.	9
III	Stacks and their array representation. Arithmetic expressions, Polish notation, Recursion, Tower of Hanoi problem. Linked representation of stacks. Queues, Dequeues. Priority queues, Operations on queue, Linked representation of queue, stack and queue applications.	9
IV	Trees, Binary trees, traversals in tree, threaded binary trees, AVL tree- create, insert, delete in AVL tree.B tree, B+ tree.	9
V	Graphs – introduction, representation, traversals, applications, spanning tree, krushkal's algo, and dijkstra's algorithm, prim's algorithm.	9
	Total	45

Text Book/s:

1. Data Structures by Richard F. Gilberg and Behrouz A. Forouzan
2. Data Structures by Seymour Lipschutz

Reference Book/s:

1.Data Structures through C by Baluja
2.Data Structures by Kanetkar

Course Code: **3BEIT04**

Title of the Course: **Digital Circuits and Fundamentals of Microprocessor**

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	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.	9
II	Combinational Logic : Decoders, Encoders, Multiplexers, Demultiplexers, Code converters, Parity circuits and comparators, Arithmetic modules- Adders, Subtractions (Half and Full), BCD adder/subtractor, ALU.	9
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.	9
IV	Introduction to 8085 microprocessor, architecture, instruction set, Timing diagrams, Flags, addressing modes, Assembly language programming, interrupts.	9
V	Memory organization & interfacing. Interfacing I/O devices PPI 8255, 8253, and its organization & interfacing with 8085.	9
	Total	45

Text Book/s:

1. Digital Design by Morris Mano
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.

Course Code: **3BEIT05**

Title of the Course: **Basic 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	Contents	Hours
I	Introduction to PN junction diode, Diode equation, Volt-ampere characteristics of p-n diode, , Breakdown Mechanisms (Avalanche and Zener breakdown) Diodes, Zener diode ,Tunnel Diode, Varactor Diode, LED, photo diode.Rectifiers Circuits:Half wave, full wave,bridge wave. Clipping and Clamping circuits.	9
II	Introduction to Bipolar Junction transistor, Transistor construction, Transistor current components, Input & Output characteristics of transistor in CB, CE, and CC configurations, Transistor biasing, Thermal runaway, Introduction to FET, JFET characteristic, biasing of FET, Comparison of BJT and FET.	9
III	Transistor as an amplifier using Barkhausen's criterion, RC phase shift,Wein bridge,LC oscillators, Crystal oscillators, FET as an amplifier. Power amplifier: classification, Class A, Class B, Class AB and Class C Power amplifier	9
IV	Basic Operational Amplifier Circuits,characteristics of Op-amp, block design,virtual ground,op-amp parameters,Linear and Nonlinear applications of op-amp,Instrumentation amplifier, Bistable ,Astable ,monostable multivibrator using transistor and OP-Amp ,555 Timer and it's applications, Schmitt trigger circuit.	9
V	Nodal and Mesh analysis equilibrium equations,matrix approach for complicated network containing voltage,current sources and reactance,source transformation,duality,Network topology.NetworkTheroms:Superposition,Reciprocity,Thevnins Therom,Nortons Therom,Maximum Power transfer Therom,compensation.	9
	Total	45

Text Book/s:

1. Electronic Devices & Circuits by Millman & Halkias.
2. Operational Amplifier & Applications by R. Gaikwad
3. Linear Network Theory by Kelkar & Pandit
4. Electrical and Electronics Measurements and Instrumentation by A.K.Sawhney

Reference Book/s:

1. Electonic Devices and circuits-I by A.P.Godse & U.A.Bakshi.

Course Code: **3BEIT06**

Title of the Course: **Data structures**

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

Sr. No.	Name of Experiments	Hours
1	Practicals based on Array and its functions	3
2	Practicals based on data structure ―stack‖ .	3
3	Practicals based on data structure ―Queue‖	3
4	Practicals based on singly linked list .	3
5	Practicals based on doubly linked list .	3
6	Practicals based on circular queue, priority queue.	3
8	Practicals based on Binary tree.	3
9	Practicals based on graph.	3
10	Practicals based on sorting techniques.	3
11	Practicals based on searching techniques.	3
	Total	33

Course Code: **3BEIT07**

Title of the Course: **Digital Circuits and Fundamentals of Microprocessor**

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

Sr. No.	Name of Experiments	Hours
1	Practicals based on verification of truth tables for a. All logic gates using ICs . b. Basic logic gates using universal gates .	3
2	Practicals based on Combinational Logic circuits using ICs.	3
3	Practicals based on Verification of De'Morgans Theorem on Bread board.	3
4	Practicals based on Design & Verification of Half & Full Adder Circuit.	3
5	Practicals based on Design & Verification of Half & Full Subtractor Circuit.	3
6	Practicals based on Design, Implementation &Verification of code convertion	3
7	Practicals based on Implementation of various Flip-Flops using NAND Gate & Verify the Truth table.	3
8	Practicals based on Design & Implementation of 3-bit & 4- bit Shift register.	3
9	Practicals based on Design & Implementation of 2,3,4- bit, Binary Counter verify its truth table.	3
10	Practicals based on Design & Implementation of up down counter.	3
11	Practicals based on Design & Implementation of 1-bit & 2-bit comparator using logic gates & IC7485.	3
12	Assembly language programming of 8085 for data transfer	3
13	Assembly language programming of 8085 for mathematical operations like multiplication.	3
14	Assembly language programming of 8085 for arrange numbers in ascending and descending orders.	3
15	Assembly language programming of 8085 for code convertion.	3
	Total	45

Course Code: **3BEIT08**
Title of the Course: **Basic Electronics**

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

Sr. No.	Name of Experiments	Hours
1	Practicals based on Diode characteristic and biasing	3
2	Practicals based on Transistor characteristic and its configuration	3
3	Practicals based on characteristics of Field Effect Transistor	3
4	Practicals based on elementary circuit of Op-amp.	3
5	Practicals based on measurement of Operational amplifier parameter-I	3
6	Practical based on measurement of Operational amplifier parameter-II	3
7	Practical based on multivibratorsusing Op-Amp.	3
8	Practicals based on IC-555 timer and its applications.	3
9	Practicals based on instrumentation amplifier.	3
10	Practical based on different network theorems.	3
	Total	30

IV Semester B. E. (Information Technology)

Course Code: **4BEIT01**

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
3	1	0	4	4	3	10	10	80	100

Unit	Contents	Hours
I	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.	9
II	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 infrence for Predicate calculus.	9
III	Semigroups and Monoids, Groups (defininitions 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.	9
IV	Lattices as partial ordered set (definition and examples). some problem of lattices as algebraic system,Sub lattices,Direct Product, Homomorphism Some special lattices, Boolean algebra (definition and examples) application to swiching circuits	9
V	Basic concepts of Graph Theory, Basic definitions, Paths. Rechability and connectedness, Matrix representation of graphs, Trees, Tree searching. Undirected trees. Minimal spanning trees.	9
	Total	45

Text Book/s:

1. Discrete Mathematics Structures with application to Computer Science by J. P.Tremblay & 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

Reference Book/s:

1. Elements of Discrete Mathematics by C. L. Liu.
2. Discrete Mathematics by Lipschutz
3.Discrete Mathematics by R.Johnsonbaugh.

Course Code: **4BEIT02**
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
3	1	0	4	3	3	10	10	80	100

Unit	Contents	Hours
I	String, Alphabet, Language, Operations, Induction and proof methods- pigeon-hole principle, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, non deterministic finite automaton, deterministic finite automaton, equivalence between NFA and DFA, Conversion of NFA into DFA, minimization of FSM, equivalence between two FSM's,Moore and Mealy machines, interconversion of two FA's with output.	12
II	Regular sets, regular expressions, identity rules, manipulation of regular expressions, equivalence between RE and FA, inter conversion, pumping lemma, closure properties of regular sets (proofs not required), regular grammars, right linear and left linear grammars equivalence between regular linear grammar and FA, inter conversion between RE and RG.	12
III	Context Free Grammar, Derivation trees, Simplification of CFG,Chomsky Normal Form, Greibach Normal Form, Push down automata, Definition, Model, Acceptance of CFL, Equivalence of CFL and PDA, Interconversion, Enumeration of properties of CFL (proofs omitted)	12
IV	Turing Machine, Definition, Model, Design of TM, Computable Functions, Recursive enumerable language, Church's hypothesis, Counter machine, Types of TM's. Chomsky hierarchy of languages, Linear bounded automata and Context Sensitive Language	12
V	Undecidability: Properties of recursive & non-recursive Enumerable languages, Universal Turing Machine, Post correspondence problem, Introduction to recursive function, Recursive function theory – basis functions and operations on them. Bounded minimalization primitive, μ recursive functions – unbounded minimalization and recursive function. Equivalence of turing computable function and μ recursive functions	12
	Total	60

Text Book/s:

1. Hopcraft H.E. & Ullman J: Introduction to Automata Theory,Languages and Computation,
2. Peter Linz: An Introduction to Formal Languages and Automata

Reference Book/s:

1. Theory of Automata, Languages & Computation,TMH, 2010 by Rajendra Kumar.
2. Theory of Computation, CENGAGE Learning, 2009. By. Rajesh K. Shukla
3. Formal Languages and Automata Theory, Mc Graw Hill,2010 by K V N Sunitha and N Kalyani
4. Introduction to Languages and the Theory of Automata by. John C. Martin.
5. Elements of Theory of Computation by Lewis H.P. and Papadimition C.H.
6. Theory of Computation by Mishra & Chandrashekharan.
7. Formal Languages and Automata Theory, Oxford University Press, 2011 by C.K.Nagpal

Course Code: **4BEIT03**

Title of the Course: **Object Oriented Programming**

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	Object oriented programming paradigm, Basic concept of object oriented programming. Benefits of OOP. Application of OOP. Structure of C++ program. Scope resolution operator. Memory management operators. Type cast operators. Member differencing operators. OOP vs procedure oriented programming.	9
II	Inline function. Arrays with in class. Memory allocation for objects. Static data member static member function. Array of objects. Objects as function arguments. Returning objects. Constructors and its types. Destructors.	9
III	Overloading , function overloading. Concept of friend function. Operator overloading. Unary operator overloading. Binary operator overloading. Overloading binary operator using friends. Manipulation of strings using operators. Type conversions.	9
IV	Inheritance-single inheritance. Multilevel inheritance. Multiple inheritance. Constructors in derived class. Pointer to object. This pointer. Pointer to derived class. Virtual function. Pure virtual function. Abstract classes.	9
V	Working with files. Opening and closing of files. Sequential and random access files. File pointer and their manipulations. Command line arguments. Introduction to templates. Class templates. Function templates. Exception handling in C++.	9
Total		45

Text Book/s:

1. Object Oriented Programming with C++ by Balaguruswamy TMH Pub

Reference Book/s:

1. Let us C++ by Yashwant Kanetkar BPB Pub
2. Object Oriented Programming in C++ by Thapi Mantha DreamTech Pub

Course Code: **4BEIT04**

Title of the Course: **System Programming**

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	Background, Machine Structure, Evolution of the components ,Evolution of Operating systems, OS User viewpoint , Functions, Batch Control Language, Facilities, General Machine Structure, Assembly Language.	9
II	Design Procedure, Design of Assembler, Statement of problem, Data structures, Format of Databases, Implementation Algorithm	9
III	Macro Instructions, Features of Macro Facility, Implementation of single and two pass Algorithms, Macro calls within macros.	9
IV	Loader Schemes, General absolute, subroutine linkages, relocating loaders, Design of Absolute Loaders, Direct-Linking Loader.	9
V	Uses of formal systems, Formal Specification, Formal Grammars, Hierarchy of Languages, BNF ,Canonic Systems.	9
	Total	45

Text Book/s:

1. John J.Donovan, systems Programming, Tata Mc Graw Hill Edition, 1991.

Reference Book/s:

1. System Software - An Introduction to Systems Programming, 3rd Edition, by Leland L.Beck Addison Wesley,1999.

2. System Programming and Operating Systems, by D.M.Dhamdhere Tata Mc Graw Hill Company, 1993.

3. Compilers Principles Techniques and Tools, by A.U.Aho,Ravi Sethi and J.D.Ullman Addison Wesley,1988.

Course Code: **4BEIT05**

Title of the Course: **Principal of Communication**

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	Fourier representation of Signals and Systems: The Fourier Transform, Properties of Fourier transform, The Inverse relationship between time and frequency, Fourier transforms of Periodic Signals, Ideal low pass filters, correlation and spectral density, Energy signals, Power Spectral density, Numerical computation of Fourier transform , Sampling theorem.	9
II	Basics of communication: Communication system, Modulation, need of modulation, baseband & pass band transmission, bandwidth requirements, Introduction of Analog and Digital Communication, Amplitude modulation: AM, generation of AM, evaluation & description of DSB-SC and DSB, SSB-SB and SSB, & VSB-SC and VSB, Baseband representation of Modulated waves and Band-pass filters. FM: Angle modulation, properties of angle modulated waves, relationship between PM and FM waves, generation of FM waves, transmission bandwidth of FM waves, demodulation of FM signals, NBFM, WBFM, Comparison of Wide & narrowband FM	9
III	Noise theory: review of probability, random variables and random process, Gaussian processes, Noise-shot noise, thermal noise, White noise, narrowband noise. Equivalent Noise temperature, types of noise: External noise, Internal noise, Noise calculations, Calculations, Noise figure, Noise temperature.	9
IV	Pulse modulation: Pulse amplitude Modulation (PAM), Pulse-position Modulation (PPM), Pulse-Division Modulation (PDM), Pulse code Modulation (PCM), Differential Pulse code modulation (DPCM), Delta Modulation (DM), Adaptive Delta Modulation (ADM). Multiplexing: time Division Multiplexing (TDM), Frequency Division Multiplexing (FDM), Comparison of TDM and FDM.	9
V	Introduction to Digital communication, Amplitude Shift Keying, Phase Shift Keying, frequency Shift keying, Quadrature Phase Shift Keying, Line coding, Basics of M-ary Communication system	9
	Total	45

Text Book/s:

1. Modern Digital and Analog communication System by B.P.Lathi
2. Communication Electronics by Kennedy
3. An Introduction to Analog and Digital Communications, 2nd Edition by Simon Haykin
4. Communication Theory, 1st Edition, Dr.J.S.Chitode

Reference Book/s:

1. Digital Communication by Dr. J.S.Chitode
2. Communication System Analog, Digital by R.P.Singh and S.D.Sapre.

Course Code: **4BEIT06**
Title of the Course: **Object Oriented Programming**

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

Sr. No.	**Name of Experiments**	Hours
1	A simple C++ program using class and objects.	3
2	A C++ program showing use of constructor and destructor.	3
3	A C++ program using array of objects.	3
4	A C++ program demonstrating use of friend function.	3
5	A C++ program using function overloading.	3
6	A C++ program showing use of operator overloading.	3
8	A C++ program for binary operator overloading.	3
9	A C++ program for single inheritance.	3
10	A C++ program for multilevel inheritance.	3
11	A file handling in C++.	3
12	A C++ program to show exception handling in C++.	3
13.	A C++ program to show use of template.	
Total		39

Course Code: **4BEIT07**

Title of the Course: **Principal of Communication**

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
0	0	1	3	2	25	25	50

Sr. No.	Name of Experiments	Hours
1	Practicals based on Sampling Theorem.	3
2	Practicals based on Time Division Multiplexing (TDM).	3
3	Practicals based on Frequency Division Multiplexing (FDM).	3
4	Practicals based on Amplitude Modulation (AM).	3
5	Practicals based on Frequency Modulation (FM).	3
6	Practicals based on Phase Modulation (PM).	3
7	Practicals based on Pulse Amplitude Modulation (PAM).	3
8	Practicals based on Pulse Position Modulation (PPM).	3
9	Practicals based on Pulse Width Modulation (PWM).	3
10	Practicals based on Pulse Code Modulation (PCM).	3
11	Practicals based on Differential Pulse Code Modulation (DPCM).	3
12	Practicals based on Delta Modulation (DM).	3
13	Practicals based on Adaptive Delta Modulation (ADM).	3
14	Practicals based on Shift Keying methods.	3
	Total	42

Course Code: **4BEIT08**

Title of the Course: **Software Technology Lab-I**

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

Sr. No.	Name of Experiments	Hours
1	Practicals based on MATLAB.	10
2	Practicals based on Linux.	10
3	Practicals based on Visual Basic.	10
	Total	30