Four Year Degree Course in Engineering & Technology
Course and Examination Scheme with Credit Grade System
Third Semester B.E. (Information Technology)

Course Code	Course Title	Teaching Scheme				Examination Scheme									
		Hours per week			No. of Credits	Theory						Laboratory			
		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						
IT301	Applied Mathematics III	3	1	0	4	3	80	10	10	100	40	--	--	--	--
IT302	Advance C Programming and Logic Design	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT303	Basic Electronics	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT304	Digital Circuits and Fundamentals of Microprocessors	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT305	Computer Architechture and Organization	3	1	0	4	3	80	10	10	100	40	--	--	--	--
Laboratories															
IT306	Advance C Programming and Logic Design	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT307	Basic Electronics	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT308	Digital Circuits & Fundamentals of Microprocessors	0	0	3	2	--	--	--	--	--	--	25	25	50	25
Total		**15**	**5**	**9**	**--**	**--**	**--**			**500**	**--**	**--**	**--**	**150**	**--**
Semester Total		**29**			**23**	**650**									

Four Year Degree Course in Engineering & Technology
Course and Examination Scheme with Credit Grade System
Fourth Semester B.E. (Information Technology)

Course Code	Course Title	Teaching Scheme				Examination Scheme									
		Hours per week			No. of Credits	Theory						Laboratory			
		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						
IT401	Applied Mathematics-IV	3	1	0	4	3	80	10	10	100	40	--	--	--	--
IT402	Data Structures	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT403	Principles of Communication	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT404	Theory Of Computation	4	1	0	5	3	80	10	10	100	40	--	--	--	--
IT405	System Programming	3	1	0	4	3	80	10	10	100	40	--	--	--	--
Laboratories															
IT406	Data Structures	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT407	Principles of Communication	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT408	Software Technology Lab-I	0	0	2	2	--	--	--	--	--	--	25	25	50	25
Total		**16**	**5**	**8**	--	--	--			**500**	--	--	--	**150**	--
Semester Total		**29**			**25**	**650**									

Four Year Degree Course in Engineering & Technology
Course and Examination Scheme with Credit Grade System
Fifth Semester B.E. (Information Technology)

Course Code	Course Title	Teaching Scheme				Examination Scheme									
		Hrs. per week			No. of Credits	Theory						Laboratory			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	Max. Marks Sessional MSE	Max. Marks Sessional IE	Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min. Passing Marks
IT501	Microprocessors and Microcontrollers	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT502	Web Technology	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT503	Object Oriented Programming	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT504	Software Engineering	4	1	0	5	3	80	10	10	100	40	--	--	--	--
IT505	Design Analysis Of Algorithm	3	1	0	4	3	80	10	10	100	40	--	--	--	--
Laboratories															
IT506	Microprocessors and Microcontrollers	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT507	Web Technology	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT508	Object Oriented Programming	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT509	Personal Proficiency-I Audit Course	--	--	--	--	--	--	--	--	--	--	50	--	50	25
Total		**16**	**5**	**9**	**--**	**--**	**--**			**500**	**--**	**--**	**--**	**200**	**--**
Semester Total Credits		**30**			**24**	**700**									

Four Year Degree Course in Engineering & Technology
Course and Examination Scheme with Credit Grade System
Sixth Semester B.E. (Information Technology)

Course Code	Course Title	Teaching Scheme				Examination Scheme									
		Hours per week			No. of Credits	Theory						Laboratory			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	Max. Marks Sessional MSE	Max. Marks Sessional IE	Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min. Passing Marks
IT601	Java Programming	4	1	0	4	3	80	10	10	100	40	--	--	--	--
IT602	Database Management Systems	4	1	0	4	3	80	10	10	100	40	--	--	--	--
IT603	Digital signal Processing	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT604	Operating Systems	4	1	0	4	3	80	10	10	100	40	--	--	--	--
IT605	Professional Management & Information Systems	2	1	0	3	3	80	10	10	100	40	--	--	--	--
	Laboratories														
IT606	Java Programming	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT607	Database Management Systems	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT608	Digital signal Processing	0	0	3	2							25	25	50	25
IT609	Mini Project	0	0	3	2	--	--	--	--	--	--	50	--	50	25
IT610	Personal Proficiency-II Audit Course	--	--	--	--	--	--	--	--	--	--	50	--	50	25
Total		**17**	**5**	**12**	**--**	**--**	**--**			**500**	**--**	**--**	**--**	**250**	**--**
Semester Total		**34**			**26**	**750**									

Four Year Degree Course in Engineering & Technology
Course and Examination Scheme with Credit Grade System
Seventh Semester B.E. (Information Technology)

Course Code	Course Title	Teaching Scheme				Examination Scheme									
		Hours per week			No. of Credits	Theory						Laboratory			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	Max. Marks Sessional MSE	Max. Marks Sessional IE	Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min. Passing Marks
IT701	Computer Networks	4	1	0	4	3	80	10	10	100	40	--	--	--	--
IT702	Wireless Communication	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT703	Data Mining & Warehousing	3	1	0	4	3	80	10	10	100	40	--	--	--	--
IT704	Elective -I	3	0	0	3	3	80	10	10	100	40	--	--	--	--
IT705	Elective-II	3	0	0	3	3	80	10	10	100	40	--	--	--	--
Laboratories															
IT706	Computer Networks	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT707	Wireless Communication	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT708	Software Technology Lab II	0	0	3	2	--	--	-	--	--	--	25	25	50	25
IT709	Project Phase I	0	0	2	2	--	--	--	--	--	--	50	50	100	50
Total		**16**	**3**	**11**	**--**	**--**	**--**			**500**	**--**	**--**	**--**	**250**	**--**
Semester Total		**30**			**25**	**750**									

Four Year Degree Course in Engineering & Technology
Course and Examination Scheme with Credit Grade System
Eighth Semester B.E. (Information Technology)

Course Code	Course Title	Teaching Scheme				Examination Scheme									
		Hours per week			No. Of Credits	Theory						Laboratory			
		L	T	P		Duration of Paper (Hrs.)	Max. Marks ESE	Max. Marks Sessional MSE	Max. Marks Sessional IE	Total	Min. Passing Marks	Max. Marks TW	Max. Marks POE	Total	Min. Passing Marks
IT801	Compiler Design	4	1	0	4	3	80	10	10	100	40	--	--	--	--
IT802	Soft Computing Techniques	3	1	0	4	3	80	10	10	100	40	--	--	--	--
IT803	TCP/IP	3	1	0	3	3	80	10	10	100	40	--	--	--	--
IT804	Elective -III	3	0	0	3	3	80	10	10	100	40	--	--	--	--
IT805	Elective-IV	3	0	0	3	3	80	10	10	100	40	--	--	--	--
Laboratories															
IT806	Compiler Design	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT807	Soft Computing Techniques	0	0	3	2	--	--	--	--	--	--	25	25	50	25
IT808	Project Phase II	0	0	6	6	--	--	--	--	--	--	75	75	150	75
Total		**16**	**3**	**12**	**--**	**--**	**--**			**500**	**--**	**--**	**--**	**250**	**--**
Semester Total		**31**			**27**	**750**									

List of Electives for seventh and eighth semester B.E Information Technology

Elective –I	1) Software Project Management 2) Advanced Computing Techniques 3) Information Retrieval System 4) System Analysis and Design
Elective –II	1) Digital Image Processing 2) Bioinformatics 3) Artificial Intelligence 4) Software Testing
Elective –III	1) Embedded Systems 2) Mobile Computing 3) Cyber Laws 4) Information Security System
Elective –IV	1) Advanced Databases 2) Ecommerce and Enterprise Resource Planning 3) Neural Networks & Fuzzy Logic 4) Multimedia Systems and Applications

Modalities for the Labs:-

Software Tech. Lab- I: -	Students are required to perform practicals based on basics of Linux, Matlab & Visual Basic.
Software Tech. Lab-II: -	Students are required to perform practicals based on Data Mining & Warehousing & Software Testing.
Seminar: -	Students are required to present seminar based on recent technical topics.
Project Phase I: -	Students are required to implement group projects based on their syllabus.
Project Phase II: -	Students are required to implement major projects in a team based on latest technology.

Gondwana University, Gadchiroli – 442 605
Faculty of Engineering & Technology
B.E. (Information Technology)

Summarised Statement Showing Various Parameters of Course and Examination Scheme

Sr No	Semester	No of Theory	No of Labs/Pract	Teaching Hours (L + T)	Teaching Hours (P)	Total No of Credits	Max Marks Theory	Max Marks Labs/Pract	Max Marks Total
1	I	4	4	17	13	26	400	250	650
2	II	5	4	21	15	30	350	250	600
3	III	5	3	20	09	23	500	150	650
4	IV	5	3	21	08	25	500	150	650
5	V	5	3	21	09	24	500	200	700
6	VI	5	4	22	12	26	500	250	750
7	VII	5	4	19	11	25	500	250	750
8	VIII	5	3	19	12	27	500	250	750
--	**--**	**39**	**28**	**160**	**89**	**206**	**3750**	**1750**	**5500**

Subject wise Board of Studies (BOS) Affiliation

Board of Studies	Subject Codes
Applied Sciences & Humanities	IT 301, IT 401
Electronics	IT303, IT304, IT501, IT603,IT702

III Semester B. E. (Information Technology)

Course Code: **IT301**
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-+DPLOWRQ 7KHRUHP_ 6\OYHVWHU¶V 7KHRUHP _VWDWHPHQW RQO\) Solution of secon 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: **IT302**

Title of the Course: **Advance C Programming and Logic Design**

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	**Understanding Programming:** Program Compilation and execution, program statement, programming syntax, Variables and Data types C operators: arithmetic, logic, relational operators. Simple I/O in c, the function main (). **Flowcharts and Psuedocode as problem solving tools:** Structure of a c Program, Element of a flowchart, writing psuedocode, a simple C examples.	9
II	**Structured Programming Decision:** Simple C Decisions, The if-else structure, writing logic Expresions, nested if-else, the switch case structure, C Program examples. Looping Problem solving using looping while loop, counter, control variable,do while loop, iterative programming using for loop.	9
III	**Modular Programming :** Function and Modular Programming , Problem solving using modules, function arguments, variables passed to the functions, function return values ,variables returned by function, function prototype, definition and call, Pass-by-value vs. Pass-by-refrence, pointers.	9
IV	**More Complex C Data types :** Arrays and pointers, arrays pointers and computer memory, array declaration and initialization, 2 dimentional n dimentional arrays, proper pointer declaration and initialization; malloc() and free(), union and structure, problem solving using structures, linked list.	9
V	**Logic design for algorithms :** Search algorithms, sequential, binary , Sorting algorithms , Insertion selection file I/O through C. Project planning in C , case study project in C.	9
	Total	45

Text Book/s:

1. Programmimg and logic design by Joyce Farrell.
2. C Programming by E Balgurusamy

Reference Book/s:

1. Let Us C by Yashwant Kanetkar
2. Exploring C by Yashwant Kanetkar

Course Code: **IT303**

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 XVLQJ %DUNKDXVHQ¶V 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 7LPHU DQG LW¶V DSSOLFDWLRQV_ 6FKPLWW WULJJHU Fircuit.	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: **IT304**

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	1 XPEHU V\VWHPV_ %RROHDQ $OJHEUD_ %DVLF ORJLF FLUFXLWV_ WUXWK WDEOHV_ 'H 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: **IT305**
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	4	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, %RRWK¶V $OJRULWKP_ ,QWHJHU 'LYLVLRQ_)ORDWLQJ SRLQW QXPEHUV DQG RSHUDWLRQ	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: **IT306**

Title of the Course: **Advance C Programming and Logic Design**

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

Sr. No.	Name of Experiments	Hours
1	Program demonstrating use of for loop.	3
2	Program demonstrating the use of loop inside loop.	3
3	Program using the concept of menu driven programming.	3
4	Program for calculation of mathematical series.	3
5	Program on concept of string.	3
6	Program using the concept of file I/O.	3
7	Program on loop in graphics.	3
8	Program on matrices & nested fors.	3
9	Program on element searching.	3
10	Program on concept of sorting.	3
	Total	30

Course Code: **IT307**
Title of the Course: **Basic Electronics**

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
0	0	3	3	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 multivibrators using 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

Course Code: **IT308**

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	3	3	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 'H¶0RUJDQV 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

IV Semester B. E. (Information Technology)

Course Code: **IT401**

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: **IT402**
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 ± LQWURGXFWLRQ_ UHSUHVHQWDWLRQ_ WUDYHUVDOV_ DSSOLFDWLRQV_ VSDQQLQJ_ WUHHV_ NUXVKNDO¶V DOJRULWKP_ SULP¶V DOJRULWKP_	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: **IT403**
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: **IT404**
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
4	1	0	5	5	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, PLQLPL]DWLRQ RI)60_ HTXLYDOHQFH EHWZHHQ WZR)60¶V_0RRUH DQG 0HDO\ PDFKLQHV_ LQWHUFRQYHUVLRQ RI WZR)$¶V ZLWK RXWSXW_	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 HQXPHUDEOH ODQJXDJH_ &KXUFK¶V K\SRWKHVLV_ &RXQWHU PDFKLQH_ 7\SHV RI 70¶V_ & 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: **IT405**
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	4	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: **IT406**
Title of the Course: **Data structures**

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

Sr. No.	Name of Experiments	Hours
1	Practicals based on Array and its functions	3
2	3UDFWLFDOV EDVHG RQ GDWD VWUXFWXUH ³VWDFN´ _	3
3	3UDFWLFDOV EDVHG RQ GDWD VWUXFWXUH ³4XHXH´	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: **IT407**
Title of the Course: **Principal of Communication**

Course Scheme					Evaluation Scheme (Laboratory)		
Lecture	Tutorial	Practical	Periods/week	Credits	TW	POE	Total
0	0	3	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: **IT408**

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

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