गुरु घासीदास विश्वविद्यालय
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
कोनी, बिलासपुर - 495009 (छ.ग.)

Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur – 495009 (C.G.)

1.1.2

List of Employability/ Entrepreneurship/ Skill Development Courses with Course Contents

Colour Codes		
Name of the Subjects	Yellow	🟨
Employability Contents	Green	🟩
Entrepreneurship Contents	Light Blue	🟦
Skill Development Contents	Pink	🟪

List of Courses Focus on Employability/ Entrepreneurship/ Skill Development

Department : ***Information Technology Engineering***

Programme Name : ***B.Tech.***

Academic Year : 2017-18

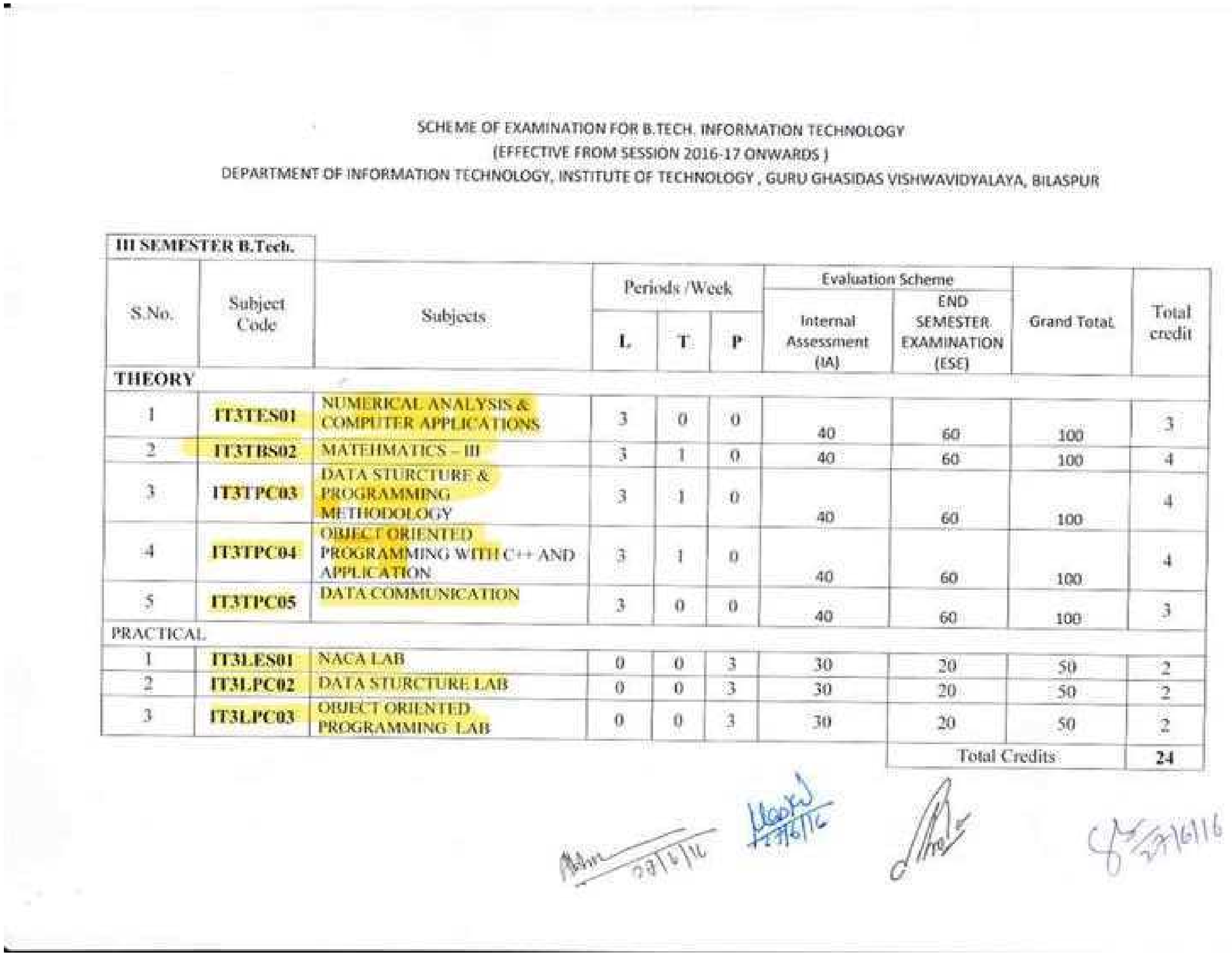
List of Courses Focus on Employability/ Entrepreneurship/Skill Development

Sr. No.	Course Code	Name of the Course
01.	IT3TES01	NUMERICAL ANALYSIS & COMPUTER APPLICATIONS
02.	IT3TBS02	MATHEMTICS-III
03.	IT3TPC03	DATA STRUCTURE & PROGRAMMING METHODOLOGY
04.	IT3TPC04	OBJECT ORIENTED PROGRAMMING WITH C++ AND APPLICATION
05.	IT3TPC05	DATA COMMUNICATION
06.	IT3LES01	NACA LAB
07.	IT3LPC02	DATA STRUCTURE LAB
08.	IT3LPC03	OBJECT ORIENTED PROGRAMMING LAB
09.	IT4TPC02	INTRODUCTION TO INFORMATION SCIENCE
10.	IT4TES03	DISCRETE STRUCTURE
11.	IT4TPC04	COMPUTER NETWORK
12.	IT4TPC05	DIGITAL LOGIC AND DESIGN
13.	IT4LPC01	DLD LAB
14.	IT4LPC02	COMPUTER NETWORK LAB
15.	IT4LPC03	MINI PROJECT
16	IT5TPC01	DATABASE MANAGEMENT SYSTEM
17	IT5TPC02	JAVA PROGRAMMING
18	IT5LPC01	DATABASE MANAGEMENT SYSTEM LAB
19	IT5LPC02	JAVA PROGRAMMING LAB
20	IT5LPC03	PROGRAMMING LAB
21	IT5TPE11	MICROPROCEESOR AND INTERFACES
22	IT5TPE15	DIGITAL & CYBER FORENSIC
23	IT5TPE21	THEORY OF COMPUTATION
24	IT5TPE22	MOBILE SOFTWARE DEVELOPMENT
25	IT5TPE23	MULTIMEDIA SYSTEM DESIGN

26	IT5TPE24	GRID AND CLOUD COMPUTING
27	IT5TOE12	SOFTWARE PROJECT MANAGEMENT
28	IT5TOE13	INTELLECTUAL PROPERTY RIGHTS
29	IT5TOE14	CYBER LAW
30	IT5TOE15	ANALYSIS AND DESIGN OF ALGORITHM
31	IT6TPC01	INTERACTIVE COMPUTER GRAPHICS
32	IT6TPC02	OPERATING SYSTEM
33	IT6LPC01	COMPUTER GRAPHICS LAB
34	IT6LPC02	OPERATION SYSTEM LAB
35	IT6LPC03	PROGRAMMING LAB
36	IT6TPE11	ADVANCE COMPUTER ORGANIZATION
37	IT6TPE12	SIMULATION AND MODELING
38	IT6TPE14	ADVANCE DATABASE
39	IT6TPE21	PARALLEL COMPUTING
40	IT6TPE22	DISTRIBUTED SYSTEM
41	IT6TPE25	MICROCONTROLLERS AND EMBEDDED SYSTEMS
42	IT6TOE12	NATURAL LANGUAGE PROCESSING
43	IT6TOE13	PATTERN RECOGNITION
44	IT6TOE14	WIRELESS AND MOBILE COMMUNICATION
45	IT6TOE15	MACHINE LEARNING
46	IT4101	Advance Operating System
47	IT4102	Introduction to .NET Technology
48	IT4103	Data Mining and Warehousing
49	IT4104	SOFTWARE ENGINEERING & PROJECT MANAGEMENT
50	IT4105	Major Project Synopsis
51	IT4106	Advance Operating System Lab
52	IT4107	.NET Technology Lab
53	IT4105	Major Project Synopsis
54	IT4201	Artificial Intelligence & Expert System
55	IT4202	Information and Network Security
56	IT4204	Information and Network Security Lab
57	IT4205	Artificial Intelligence & Expert System Lab
58	IT4206	Major Project
59	IT4108	Wireless Sensor Network
60	IT4109	Digital Signal Processing

61	IT4110	Image Processing
62	IT4111	Multimedia System Design
63	IT4207	Software Testing and Quality Management
64	IT4209	Grid and Cloud Computing

Scheme and Syllabus



SCHEME OF EXAMINATION FOR B.TECH. INFORMATION TECHNOLOGY
(EFFECTIVE FROM SESSION 2016-17 ONWARDS)
DEPARTMENT OF INFORMATION TECHNOLOGY, INSTITUTE OF TECHNOLOGY , GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

III SEMESTER B.Tech.

S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment (IA)	END SEMESTER EXAMINATION (ESE)		
THEORY									
1	IT3TES01	NUMERICAL ANALYSIS & COMPUTER APPLICATIONS	3	0	0	40	60	100	3
2	IT3TBS02	MATEHMATICS – III	3	1	0	40	60	100	4
3	IT3TPC03	DATA STURCTURE & PROGRAMMING METHODOLOGY	3	1	0	40	60	100	4
4	IT3TPC04	OBJECT ORIENTED PROGRAMMING WITH C++ AND APPLICATION	3	1	0	40	60	100	4
5	IT3TPC05	DATA COMMUNICATION	3	0	0	40	60	100	3
PRACTICAL									
1	IT3LES01	NACA LAB	0	0	3	30	20	50	2
2	IT3LPC02	DATA STURCTURE LAB	0	0	3	30	20	50	2
3	IT3LPC03	OBJECT ORIENTED PROGRAMMING LAB	0	0	3	30	20	50	2
							Total Credits		**24**

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SCHEME OF EXAMINATION FOR B.TECH. INFORMATION TECHNOLOGY

(EFFECTIVE FROM SESSION 2016-17 ONWARDS)

DEPARTMENT OF INFORMATION TECHNOLOGY, INSTITUTE OF TECHNOLOGY , GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

IV SEMESTER B.Tech.

S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
1	**IT4THS01**	ENGG. ECONOMICS	3	0	0	40	60	100	3
2	**IT4TPC02**	INTRODUCTION TO INFORMATION SCIENCE	3	0	0	40	60	100	3
3	**IT4TES03**	DISCRETE STRUCTURE	3	1	0	40	60	100	4
4	**IT4TPC04**	COMPUTER NETWORK	3	1	0	40	60	100	4
5	**IT4TPC05**	DIGITAL LOGIC AND DESIGN	3	1	0	40	60	100	4
PRACTICAL									
1	**IT4LPC01**	DLD LAB	0	0	3	30	20	50	2
2	**IT4LPC02**	COMPUTER NETWORK LAB	0	0	3	30	20	50	2
3	**IT4LPC03**	MINI PROJECT	0	0	3	30	20	50	2
							Total Credits		**24**

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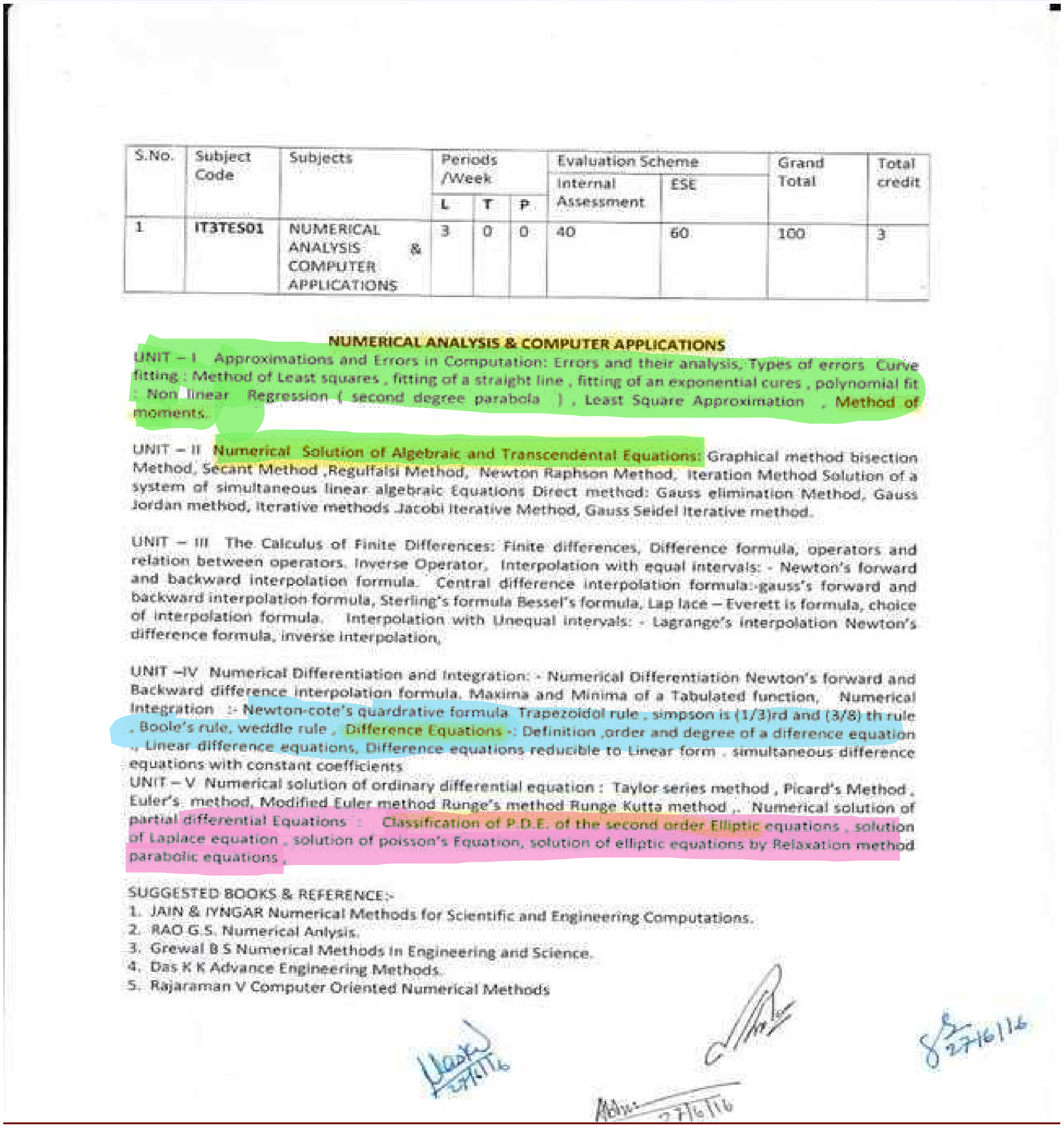

S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
1	**IT3TES01**	NUMERICAL ANALYSIS & COMPUTER APPLICATIONS	3	0	0	40	60	100	3

NUMERICAL ANALYSIS & COMPUTER APPLICATIONS

UNIT – I Approximations and Errors in Computation: Errors and their analysis, Types of errors Curve fitting : Method of Least squares , fitting of a straight line , fitting of an exponential cures , polynomial fit : Non linear Regression (second degree parabola) , Least Square Approximation , Method of moments.

UNIT – II Numerical Solution of Algebraic and Transcendental Equations: Graphical method bisection Method, Secant Method ,Regulfalsi Method, Newton Raphson Method, Iteration Method Solution of a system of simultaneous linear algebraic Equations Direct method: Gauss elimination Method, Gauss Jordan method, Iterative methods Jacobi Iterative Method, Gauss Seidel Iterative method.

UNIT – III The Calculus of Finite Differences: Finite differences, Difference formula, operators and relation between operators. Inverse Operator, Interpolation with equal intervals: - Newton's forward and backward interpolation formula. Central difference interpolation formula:-gauss's forward and backward interpolation formula, Sterling's formula Bessel's formula, Lap lace – Everett is formula, choice of interpolation formula. Interpolation with Unequal intervals: - Lagrange's interpolation Newton's difference formula, inverse interpolation,

UNIT –IV Numerical Differentiation and Integration: - Numerical Differentiation Newton's forward and Backward difference interpolation formula. Maxima and Minima of a Tabulated function, Numerical Integration :- Newton-cote's quardrative formula Trapezoidol rule , simpson is (1/3)rd and (3/8) th rule , Boole's rule, weddle rule , Difference Equations -: Definition ,order and degree of a diference equation ., Linear difference equations, Difference equations reducible to Linear form . simultaneous difference equations with constant coefficients

UNIT – V Numerical solution of ordinary differential equation : Taylor series method , Picard's Method , Euler's method, Modified Euler method Runge's method Runge Kutta method ,. Numerical solution of partial differential Equations : Classification of P.D.E. of the second order Elliptic equations , solution of Laplace equation , solution of poisson's Equation, solution of elliptic equations by Relaxation method parabolic equations ,

SUGGESTED BOOKS & REFERENCE:-

1. JAIN & IYNGAR Numerical Methods for Scientific and Engineering Computations.
2. RAO G.S. Numerical Anlysis.
3. Grewal B S Numerical Methods in Engineering and Science.
4. Das K K Advance Engineering Methods.
5. Rajaraman V Computer Oriented Numerical Methods

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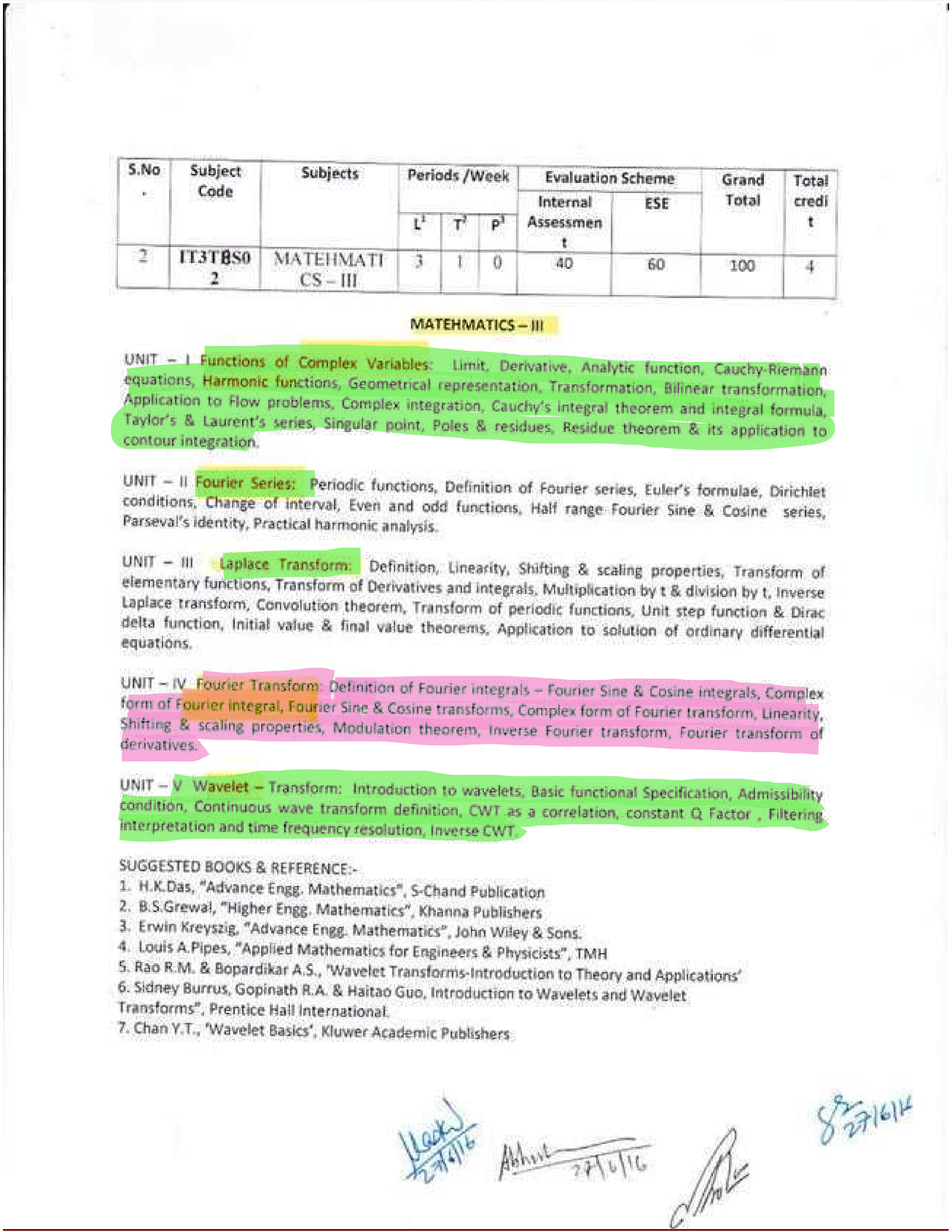

S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L^1	T^2	P^3	Internal Assessment	ESE		
2	IT3TBS02	MATEHMATICS – III	3	1	0	40	60	100	4

MATEHMATICS – III

UNIT – I Functions of Complex Variables: Limit, Derivative, Analytic function, Cauchy-Riemann equations, Harmonic functions, Geometrical representation, Transformation, Bilinear transformation, Application to Flow problems, Complex integration, Cauchy's integral theorem and integral formula, Taylor's & Laurent's series, Singular point, Poles & residues, Residue theorem & its application to contour integration.

UNIT – II Fourier Series: Periodic functions, Definition of Fourier series, Euler's formulae, Dirichlet conditions, Change of interval, Even and odd functions, Half range Fourier Sine & Cosine series, Parseval's identity, Practical harmonic analysis.

UNIT – III Laplace Transform: Definition, Linearity, Shifting & scaling properties, Transform of elementary functions, Transform of Derivatives and integrals, Multiplication by t & division by t, Inverse Laplace transform, Convolution theorem, Transform of periodic functions, Unit step function & Dirac delta function, Initial value & final value theorems, Application to solution of ordinary differential equations.

UNIT – IV Fourier Transform: Definition of Fourier integrals – Fourier Sine & Cosine integrals, Complex form of Fourier integral, Fourier Sine & Cosine transforms, Complex form of Fourier transform, Linearity, Shifting & scaling properties, Modulation theorem, Inverse Fourier transform, Fourier transform of derivatives.

UNIT – V Wavelet – Transform: Introduction to wavelets, Basic functional Specification, Admissibility condition, Continuous wave transform definition, CWT as a correlation, constant Q Factor , Filtering interpretation and time frequency resolution, Inverse CWT.

SUGGESTED BOOKS & REFERENCE:-
1. H.K.Das, "Advance Engg. Mathematics", S-Chand Publication
2. B.S.Grewal, "Higher Engg. Mathematics", Khanna Publishers
3. Erwin Kreyszig, "Advance Engg. Mathematics", John Wiley & Sons.
4. Louis A.Pipes, "Applied Mathematics for Engineers & Physicists", TMH
5. Rao R.M. & Bopardikar A.S., 'Wavelet Transforms-Introduction to Theory and Applications'
6. Sidney Burrus, Gopinath R.A. & Haitao Guo, Introduction to Wavelets and Wavelet Transforms", Prentice Hall International.
7. Chan Y.T., 'Wavelet Basics', Kluwer Academic Publishers

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S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
3	IT3TPC03	DATA STURCTURE & PROGRAMMING METHODOLOGY	3	1	0	40	60	100	4

DATA STURCTURE & PROGRAMMING METHODOLOGY

UNIT- I

Introduction: Basic Terminology, Definition of Data Structure, Types of Data Structure, Operation on Data Structure, **Arrays:** Array Definition, Representation of Arrays: Row Major Order, and Column Major Order. **Searching and Sorting:** Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Binary Search, Linear Search.

UNIT II

Linked lists: Definition, Representation and Implementation of Singly Linked Lists, Traversing and Searching of Linked List, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly Linked List, Circularly Linked List.

UNIT III

Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack.,
Queue: Array and linked representation of queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Deques.

UNIT IV

Trees: Basic Technology , Binary Tree , Binary tree representation , Algebraic Expressions , Complete Binary Tree, Extended Binary Tree, Full Binary Tree, Array and linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Binary search trees (BST), Insertion and deletion in BST, AVL trees, Heap and heap sort.

UNIT V

Graph: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Weighted Graph, Sequential Representations of Graphs, Adjacency Matrices, Adjacency List, Path Matrices, Linked Representations of Graphs, Graph Traversal - DFS, BFS, Shortest Path algorithm: Warshal Algorithm and Dijikstra Algorithm, Spanning Trees, Minimum Cost Spanning Trees: Prims and Kruskal algorithm.

References books:

1. Lipschutz, "Data Structures with C" Schaum's Outline Series, TMH.
2. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd.
3. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education Asia.
4. A. M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd.
5. K Loudon, "Mastering Algorithms with C", Shroff Publisher & Distributors Pvt. Ltd.
6. Jean Paul Trembley and Paul G. Sorenson, "An Introduction to Data Structures with applications", McGraw Hill.
7. G A V Pai, "Data Structures and Algorithms", TMH.
8. G.S.Baluja, "Data Structures through C", Dhanpat Rai & Co.
9. Yashavant Kanetkar, "Data Structure Through C", BPB Publication.

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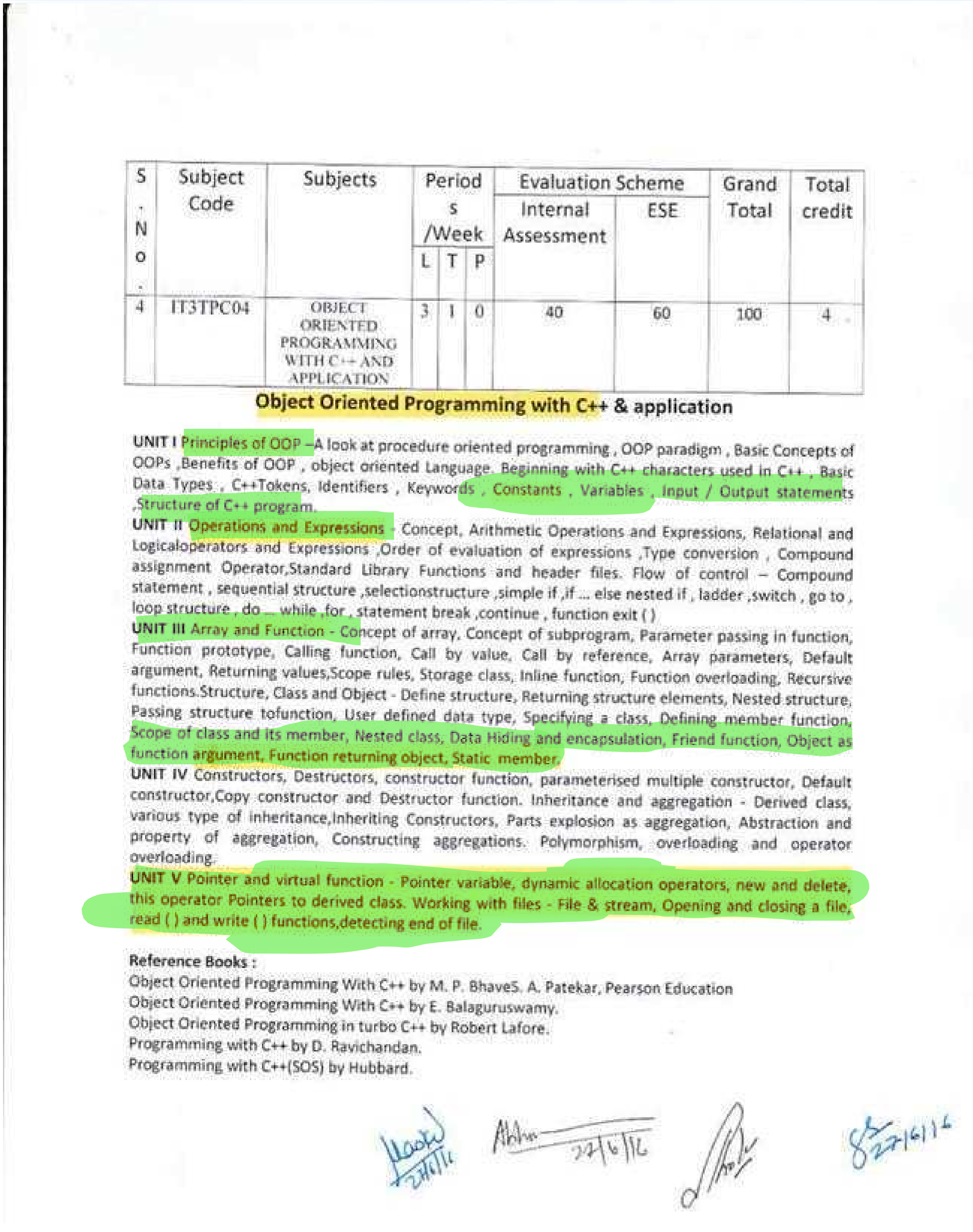

S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
4	IT3TPC04	OBJECT ORIENTED PROGRAMMING WITH C++ AND APPLICATION	3	1	0	40	60	100	4

Object Oriented Programming with C++ & application

UNIT I Principles of OOP –A look at procedure oriented programming , OOP paradigm , Basic Concepts of OOPs ,Benefits of OOP , object oriented Language. Beginning with C++ characters used in C++ , Basic Data Types , C++Tokens, Identifiers , Keywords , Constants , Variables , Input / Output statements ,Structure of C++ program.

UNIT II Operations and Expressions - Concept, Arithmetic Operations and Expressions, Relational and Logicaloperators and Expressions ,Order of evaluation of expressions ,Type conversion , Compound assignment Operator,Standard Library Functions and header files. Flow of control – Compound statement , sequential structure ,selectionstructure ,simple if ,if ... else nested if , ladder ,switch , go to , loop structure , do ... while ,for , statement break ,continue , function exit ( )

UNIT III Array and Function - Concept of array, Concept of subprogram, Parameter passing in function, Function prototype, Calling function, Call by value, Call by reference, Array parameters, Default argument, Returning values,Scope rules, Storage class, Inline function, Function overloading, Recursive functions.Structure, Class and Object - Define structure, Returning structure elements, Nested structure, Passing structure tofunction, User defined data type, Specifying a class, Defining member function, Scope of class and its member, Nested class, Data Hiding and encapsulation, Friend function, Object as function argument, Function returning object, Static member.

UNIT IV Constructors, Destructors, constructor function, parameterised multiple constructor, Default constructor,Copy constructor and Destructor function. Inheritance and aggregation - Derived class, various type of inheritance,Inheriting Constructors, Parts explosion as aggregation, Abstraction and property of aggregation, Constructing aggregations. Polymorphism, overloading and operator overloading.

UNIT V Pointer and virtual function - Pointer variable, dynamic allocation operators, new and delete, this operator Pointers to derived class. Working with files - File & stream, Opening and closing a file, read ( ) and write ( ) functions,detecting end of file.

Reference Books :

Object Oriented Programming With C++ by M. P. BhaveS. A. Patekar, Pearson Education
Object Oriented Programming With C++ by E. Balaguruswamy.
Object Oriented Programming in turbo C++ by Robert Lafore.
Programming with C++ by D. Ravichandan.
Programming with C++(SOS) by Hubbard.

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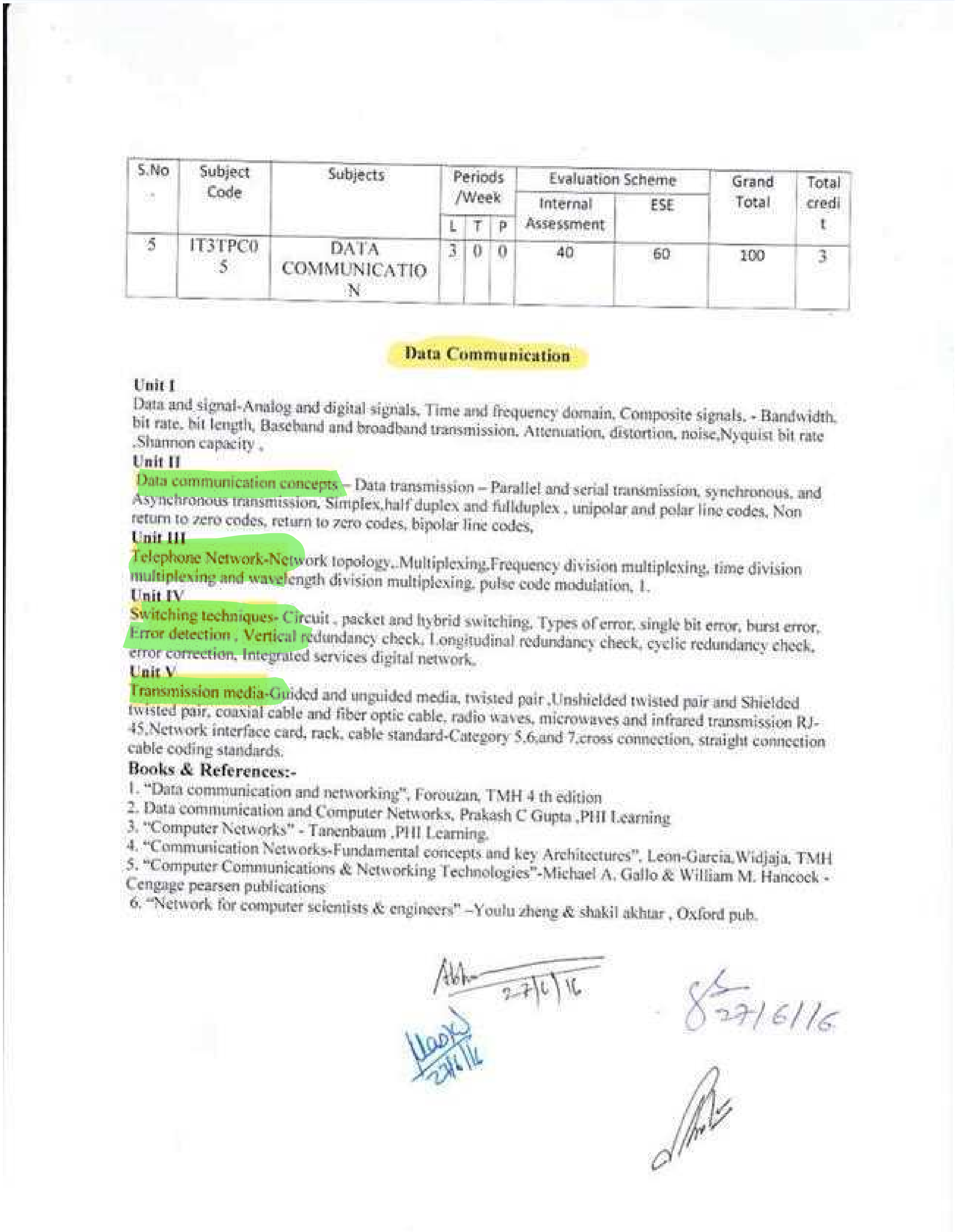

S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
5	IT3TPC05	DATA COMMUNICATION	3	0	0	40	60	100	3

Data Communication

Unit I

Data and signal-Analog and digital signals, Time and frequency domain, Composite signals. - Bandwidth, bit rate, bit length, Baseband and broadband transmission. Attenuation, distortion, noise,Nyquist bit rate ,Shannon capacity ,

Unit II

Data communication concepts – Data transmission – Parallel and serial transmission, synchronous, and Asynchronous transmission, Simplex,half duplex and fullduplex , unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes,

Unit III

Telephone Network-Network topology,.Multiplexing,Frequency division multiplexing, time division multiplexing and wavelength division multiplexing, pulse code modulation, 1.

Unit IV

Switching techniques- Circuit , packet and hybrid switching, Types of error, single bit error, burst error, Error detection , Vertical redundancy check, Longitudinal redundancy check, cyclic redundancy check, error correction, Integrated services digital network,

Unit V

Transmission media-Guided and unguided media, twisted pair ,Unshielded twisted pair and Shielded twisted pair, coaxial cable and fiber optic cable, radio waves, microwaves and infrared transmission RJ-45,Network interface card, rack, cable standard-Category 5,6,and 7,cross connection, straight connection cable coding standards.

Books & References:-

1. "Data communication and networking", Forouzan, TMH 4 th edition
2. Data communication and Computer Networks, Prakash C Gupta ,PHI Learning
3. "Computer Networks" - Tanenbaum ,PHI Learning.
4. "Communication Networks-Fundamental concepts and key Architectures", Leon-Garcia,Widjaja, TMH
5. "Computer Communications & Networking Technologies"-Michael A. Gallo & William M. Hancock - Cengage pearsen publications
6. "Network for computer scientists & engineers" –Youlu zheng & shakil akhtar , Oxford pub.

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S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
2	IT4TPC02	INTRODUCTION TO INFORMATION SCIENCE	3	0	0	40	60	100	3

INTRODUCTION TO INFORMATION SCIENCE

UNIT-I

Uncertainty, Information and Entropy Information Measures: Characteristics on information measure; Shannon's concept of information; Shannon's measure of information; Model for source coding theorem; Communication system; Source coding and line/channel coding; channel models, channel mutual information capacity (Bandwidth).

UNIT-II

Channel coding, Theorem for discrete memory less channel, Information capacity theorem:Error detecting and error correcting codes; Types of codes; Block codes; Tree codes; Hamming codes;Description of linear block codes by matrices; Description of linear tree code by matrices; Parity check
codes; Parity check polynomials.

UNIT-III

Compression: Lossless and lossy; Huffman codes; Binary Image compression schemes; Runlength Encoding; CCITT group-3 1D compression; CCITT group-3 2D compression; CCITT group-42D compression.

UNIT-IV

Video Image Compression: Requirement of full motion video compression; CCITT H 261video coding algorithm; MPEG compression methodology; MPEG-2 compression; Audio (Speech)compression.

UNIT-V

Cryptography: Encryption; Decryption; Cryptogram (cipher text); Concept of cipher;Cryptanalysis; Keys: Single key (Secret key); Cryptography; two-key (Public key) cryptography; Single key cryptography; Ciphers; Block Cipher code; Stream ciphers; Requirements for secrecy; The data Encryption Standard; Public Key Cryptography; Diffie-Hellmann public key distribution; The Rivest-Shamin Adelman(R-S-A) system for public key cryptography; Digital Signature.

Text Books:

1. Digital Communication by Das, Mullick & Chatterjee, New Age Pub.
2. Digital Communication by Proakis, TMH
3. Digital Image Processing by Gonzales & Woods, Pearson (for Unit – III & IV)
4. Local Area Network by G. Keiser, TMH (for Unit – V)

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S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
3	IT4TES03	DISCRETE STRUCTURE	3	1	0	40	60	100	4

DISCRETE STRUCTURE

UNIT-I:

Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, equivalence relation, and partial ordering relation. Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions. Theorem proving Techniques: mathematical induction (simple and strong), pigeonhole principle, prove by contradiction.

UNIT-II:

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings .

UNIT-III:

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded I and complemented lattices. Boolean Algebra: Basic definitions, sum of products and product of sums, form in Boolean Algebra, Logic gates and Karnaugh maps. Tree: Definition, Rooted tree, properties of trees.

UNIT-IV:

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, Contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers.

UNIT-V:

Combinatorics & Graphs: Recurrence Relation, Generating function., Simple graph, multi graph, graph terminology, representation of graphs, Bipartite, Regular, Planar and connected graphs, connected components in a graph, Euler graphs, Hamiltonian path and circuits, Graph coloring, chromatic number, isomorphism and Homomorphism of graphs.

Text books and Supplementary reading:

1. Liptschutz, Seymour, " Discrete Mathematics", McGraw Hill.
2. Trembley, J.P & R. Manohar, "Discrete Mathematical Structure with Application to Computer Science",
McGraw Hill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
4. Deo, Narsingh, "Graph Theory With application to Engineering and Computer.Science.", PHI.
5. Krishnamurthy, V., "Combinatorics Theory & Application", East-West Press Pvt. Ltd.,

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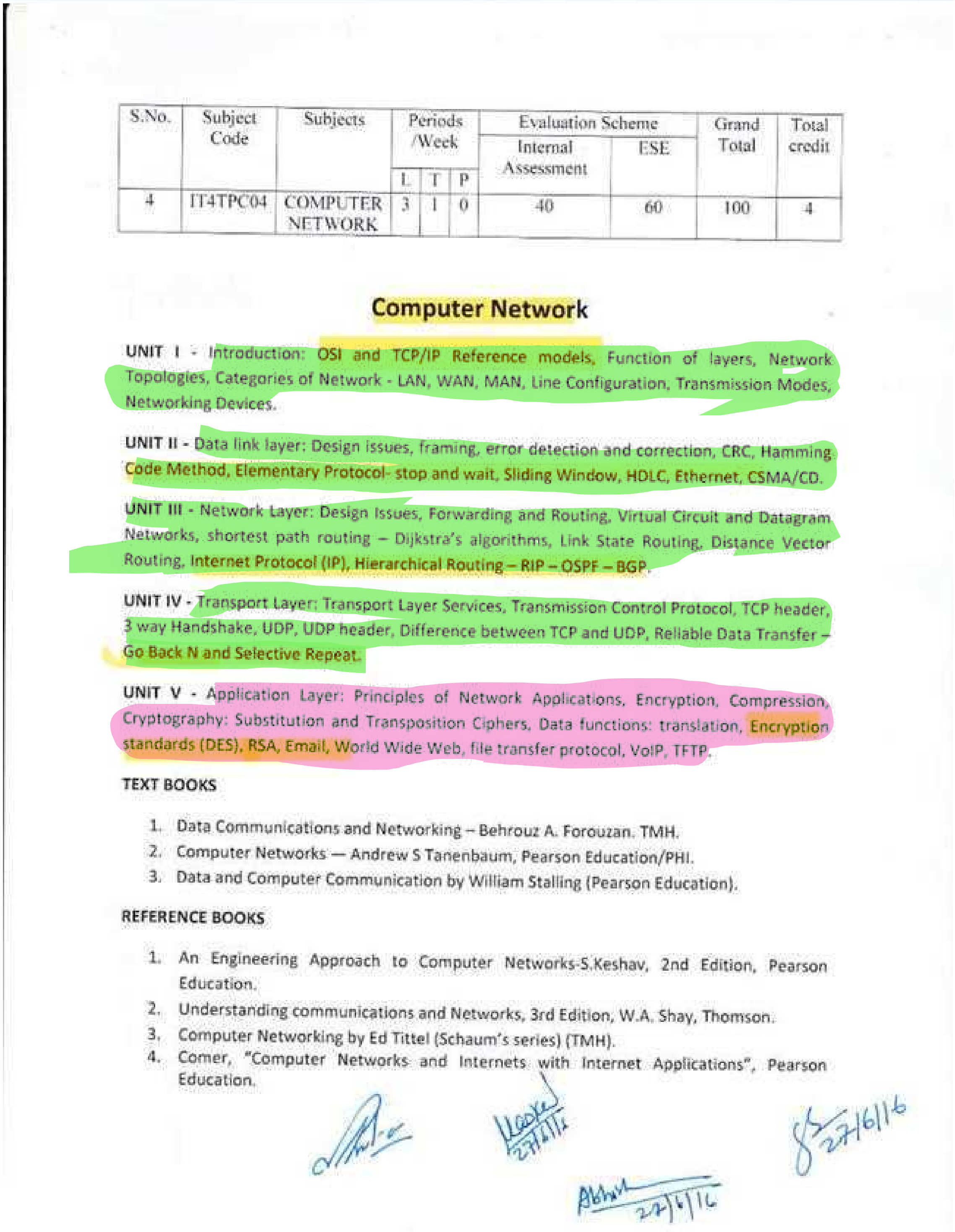

S.No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
4	IT4TPC04	COMPUTER NETWORK	3	1	0	40	60	100	4

Computer Network

UNIT I - Introduction: OSI and TCP/IP Reference models, Function of layers, Network Topologies, Categories of Network - LAN, WAN, MAN, Line Configuration, Transmission Modes, Networking Devices.

UNIT II - Data link layer: Design issues, framing, error detection and correction, CRC, Hamming Code Method, Elementary Protocol- stop and wait, Sliding Window, HDLC, Ethernet, CSMA/CD.

UNIT III - Network Layer: Design Issues, Forwarding and Routing, Virtual Circuit and Datagram Networks, shortest path routing – Dijkstra's algorithms, Link State Routing, Distance Vector Routing, Internet Protocol (IP), Hierarchical Routing – RIP – OSPF – BGP.

UNIT IV - Transport Layer: Transport Layer Services, Transmission Control Protocol, TCP header, 3 way Handshake, UDP, UDP header, Difference between TCP and UDP, Reliable Data Transfer – Go Back N and Selective Repeat.

UNIT V - Application Layer: Principles of Network Applications, Encryption, Compression, Cryptography: Substitution and Transposition Ciphers, Data functions: translation, Encryption standards (DES), RSA, Email, World Wide Web, file transfer protocol, VoIP, TFTP.

TEXT BOOKS

1. Data Communications and Networking – Behrouz A. Forouzan. TMH.
2. Computer Networks — Andrew S Tanenbaum, Pearson Education/PHI.
3. Data and Computer Communication by William Stalling (Pearson Education).

REFERENCE BOOKS

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson.
3. Computer Networking by Ed Tittel (Schaum's series) (TMH).
4. Comer, "Computer Networks and Internets with Internet Applications", Pearson Education.

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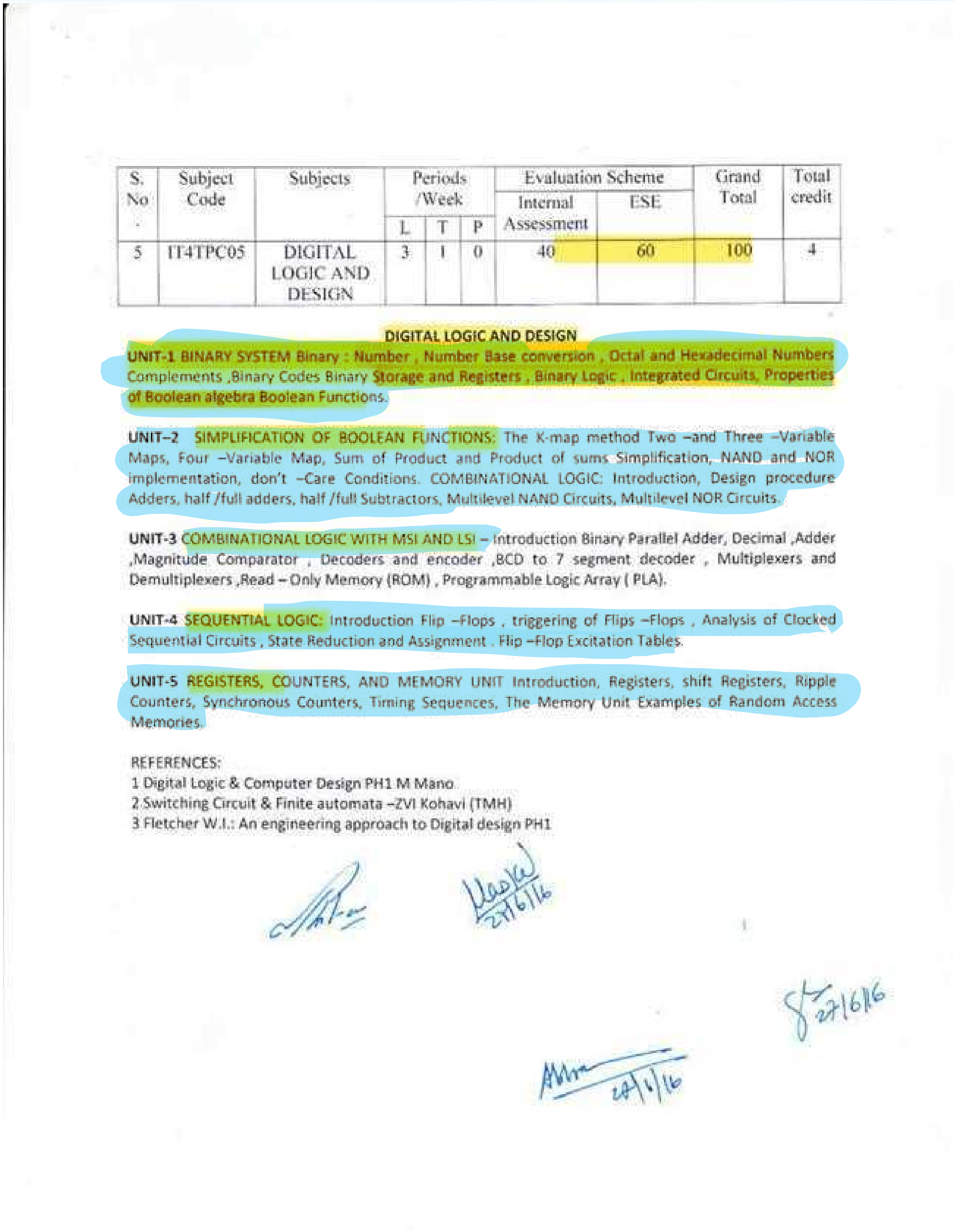

S. No.	Subject Code	Subjects	Periods /Week			Evaluation Scheme		Grand Total	Total credit
			L	T	P	Internal Assessment	ESE		
5	IT4TPC05	DIGITAL LOGIC AND DESIGN	3	1	0	40	60	100	4

DIGITAL LOGIC AND DESIGN

UNIT-1 BINARY SYSTEM Binary : Number , Number Base conversion , Octal and Hexadecimal Numbers Complements ,Binary Codes Binary Storage and Registers , Binary Logic , Integrated Circuits, Properties of Boolean algebra Boolean Functions.

UNIT–2 SIMPLIFICATION OF BOOLEAN FUNCTIONS: The K-map method Two –and Three –Variable Maps, Four –Variable Map, Sum of Product and Product of sums Simplification, NAND and NOR implementation, don't –Care Conditions. COMBINATIONAL LOGIC: Introduction, Design procedure Adders, half /full adders, half /full Subtractors, Multilevel NAND Circuits, Multilevel NOR Circuits.

UNIT-3 COMBINATIONAL LOGIC WITH MSI AND LSI – Introduction Binary Parallel Adder, Decimal ,Adder ,Magnitude Comparator , Decoders and encoder ,BCD to 7 segment decoder , Multiplexers and Demultiplexers ,Read – Only Memory (ROM) , Programmable Logic Array (PLA).

UNIT-4 SEQUENTIAL LOGIC: Introduction Flip –Flops , triggering of Flips –Flops , Analysis of Clocked Sequential Circuits , State Reduction and Assignment . Flip –Flop Excitation Tables.

UNIT-5 REGISTERS, COUNTERS, AND MEMORY UNIT Introduction, Registers, shift Registers, Ripple Counters, Synchronous Counters, Timing Sequences, The Memory Unit Examples of Random Access Memories.

REFERENCES:
1 Digital Logic & Computer Design PH1 M Mano
2 Switching Circuit & Finite automata –ZVI Kohavi (TMH)
3 Fletcher W.I.: An engineering approach to Digital design PH1

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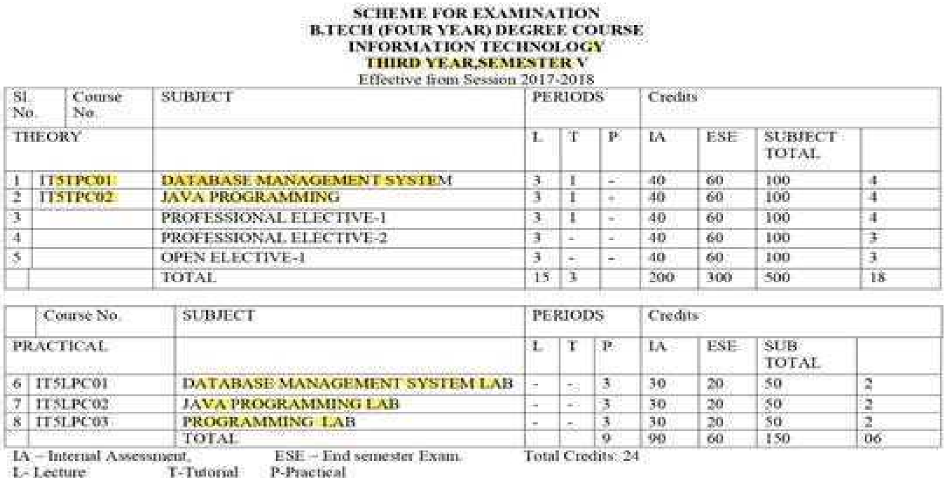
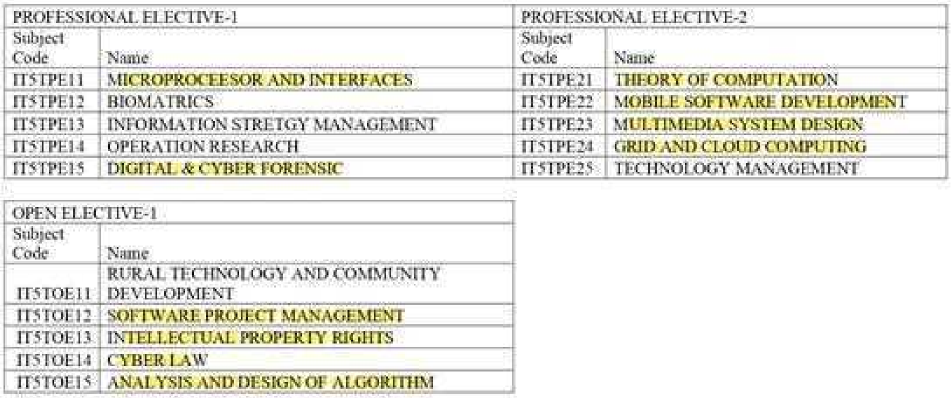


SCHEME FOR EXAMINATION
B.TECH (FOUR YEAR) DEGREE COURSE
INFORMATION TECHNOLOGY
THIRD YEAR,SEMESTER V
Effective from Session 2017-2018

Sl. No.	Course No.	SUBJECT	PERIODS			Credits			
THEORY			L	T	P	IA	ESE	SUBJECT TOTAL	
1	IT5TPC01	DATABASE MANAGEMENT SYSTEM	3	1	-	40	60	100	4
2	IT5TPC02	JAVA PROGRAMMING	3	1	-	40	60	100	4
3		PROFESSIONAL ELECTIVE-1	3	1	-	40	60	100	4
4		PROFESSIONAL ELECTIVE-2	3	-	-	40	60	100	3
5		OPEN ELECTIVE-1	3	-	-	40	60	100	3
		TOTAL	15	3		200	300	500	18

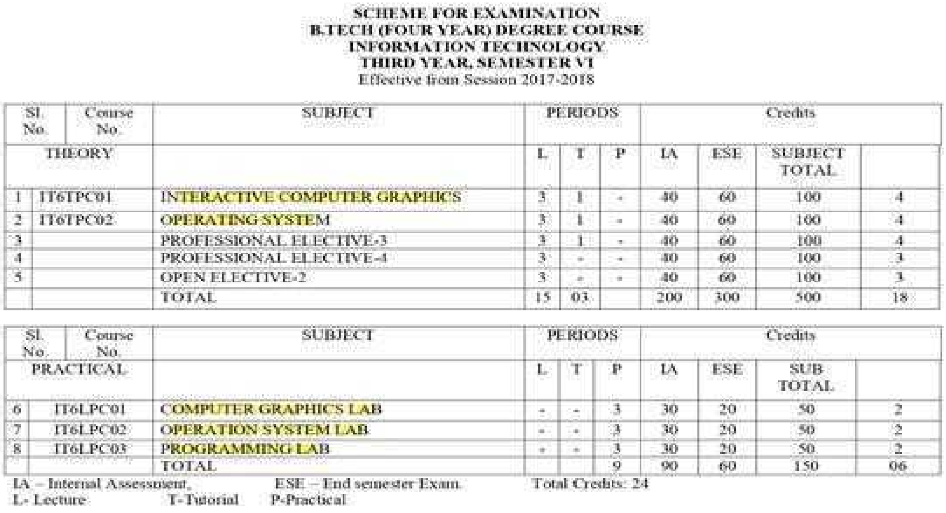
	Course No.	SUBJECT	PERIODS			Credits			
PRACTICAL			L	T	P	IA	ESE	SUB TOTAL	
6	IT5LPC01	DATABASE MANAGEMENT SYSTEM LAB	-	-	3	30	20	50	2
7	IT5LPC02	JAVA PROGRAMMING LAB	-	-	3	30	20	50	2
8	IT5LPC03	PROGRAMMING LAB	-	-	3	30	20	50	2
		TOTAL			9	90	60	150	06

IA – Internal Assessment, ESE – End semester Exam. Total Credits: 24
L- Lecture T-Tutorial P-Practical



PROFESSIONAL ELECTIVE-1		PROFESSIONAL ELECTIVE-2	
Subject Code	Name	Subject Code	Name
IT5TPE11	MICROPROCEESOR AND INTERFACES	IT5TPE21	THEORY OF COMPUTATION
IT5TPE12	BIOMATRICS	IT5TPE22	MOBILE SOFTWARE DEVELOPMENT
IT5TPE13	INFORMATION STRETGY MANAGEMENT	IT5TPE23	MULTIMEDIA SYSTEM DESIGN
IT5TPE14	OPERATION RESEARCH	IT5TPE24	GRID AND CLOUD COMPUTING
IT5TPE15	DIGITAL & CYBER FORENSIC	IT5TPE25	TECHNOLOGY MANAGEMENT

OPEN ELECTIVE-1	
Subject Code	Name
IT5TOE11	RURAL TECHNOLOGY AND COMMUNITY DEVELOPMENT
IT5TOE12	SOFTWARE PROJECT MANAGEMENT
IT5TOE13	INTELLECTUAL PROPERTY RIGHTS
IT5TOE14	CYBER LAW
IT5TOE15	ANALYSIS AND DESIGN OF ALGORITHM

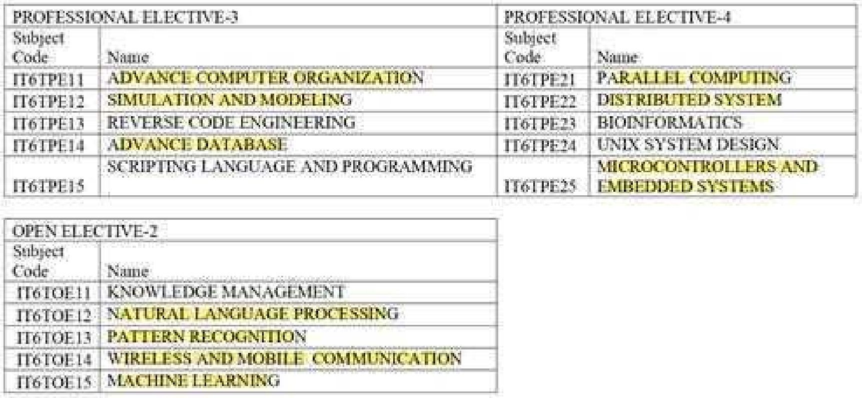


SCHEME FOR EXAMINATION
B.TECH (FOUR YEAR) DEGREE COURSE
INFORMATION TECHNOLOGY
THIRD YEAR, SEMESTER VI
Effective from Session 2017-2018

Sl. No.	Course No.	SUBJECT	PERIODS			Credits			
THEORY			L	T	P	IA	ESE	SUBJECT TOTAL	
1	IT6TPC01	INTERACTIVE COMPUTER GRAPHICS	3	1	-	40	60	100	4
2	IT6TPC02	OPERATING SYSTEM	3	1	-	40	60	100	4
3		PROFESSIONAL ELECTIVE-3	3	1	-	40	60	100	4
4		PROFESSIONAL ELECTIVE-4	3	-	-	40	60	100	3
5		OPEN ELECTIVE-2	3	-	-	40	60	100	3
		TOTAL	15	03		200	300	500	18

Sl. No.	Course No.	SUBJECT	PERIODS			Credits			
PRACTICAL			L	T	P	IA	ESE	SUB TOTAL	
6	IT6LPC01	COMPUTER GRAPHICS LAB	-	-	3	30	20	50	2
7	IT6LPC02	OPERATION SYSTEM LAB	-	-	3	30	20	50	2
8	IT6LPC03	PROGRAMMING LAB	-	-	3	30	20	50	2
		TOTAL			9	90	60	150	06

IA – Internal Assessment, ESE – End semester Exam. Total Credits: 24
L- Lecture T-Tutorial P-Practical



PROFESSIONAL ELECTIVE-3		PROFESSIONAL ELECTIVE-4	
Subject Code	Name	Subject Code	Name
IT6TPE11	ADVANCE COMPUTER ORGANIZATION	IT6TPE21	PARALLEL COMPUTING
IT6TPE12	SIMULATION AND MODELING	IT6TPE22	DISTRIBUTED SYSTEM
IT6TPE13	REVERSE CODE ENGINEERING	IT6TPE23	BIOINFORMATICS
IT6TPE14	ADVANCE DATABASE	IT6TPE24	UNIX SYSTEM DESIGN
IT6TPE15	SCRIPTING LANGUAGE AND PROGRAMMING	IT6TPE25	MICROCONTROLLERS AND EMBEDDED SYSTEMS

OPEN ELECTIVE-2	
Subject Code	Name
IT6TOE11	KNOWLEDGE MANAGEMENT
IT6TOE12	NATURAL LANGUAGE PROCESSING
IT6TOE13	PATTERN RECOGNITION
IT6TOE14	WIRELESS AND MOBILE COMMUNICATION
IT6TOE15	MACHINE LEARNING

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPC01	3	1	0	4 HOURS	40	60	4

DATA BASE MANAGEMENT SYSTEM

UNIT- I INTRODUCTION:

An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure. Data Modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

UNIT- II RELATIONAL DATA MODEL AND LANGUAGE:

Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus, Introduction to SQL: Characteristics of SQL. Advantage of SQL. SQL data types and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations. Joins, Unions, Intersection, Minus, Cursors in SQL, introduction to PL/SQL

UNIT- III DATA BASE DESIGN & NORMALIZATION:

Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependences, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

UNIT- IV TRANSACTION PROCESSING CONCEPTS:

Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures, log based recovery, checkpoints, deadlock handling.

UNIT- V CONCURRENCY CONTROL TECHNIQUES:

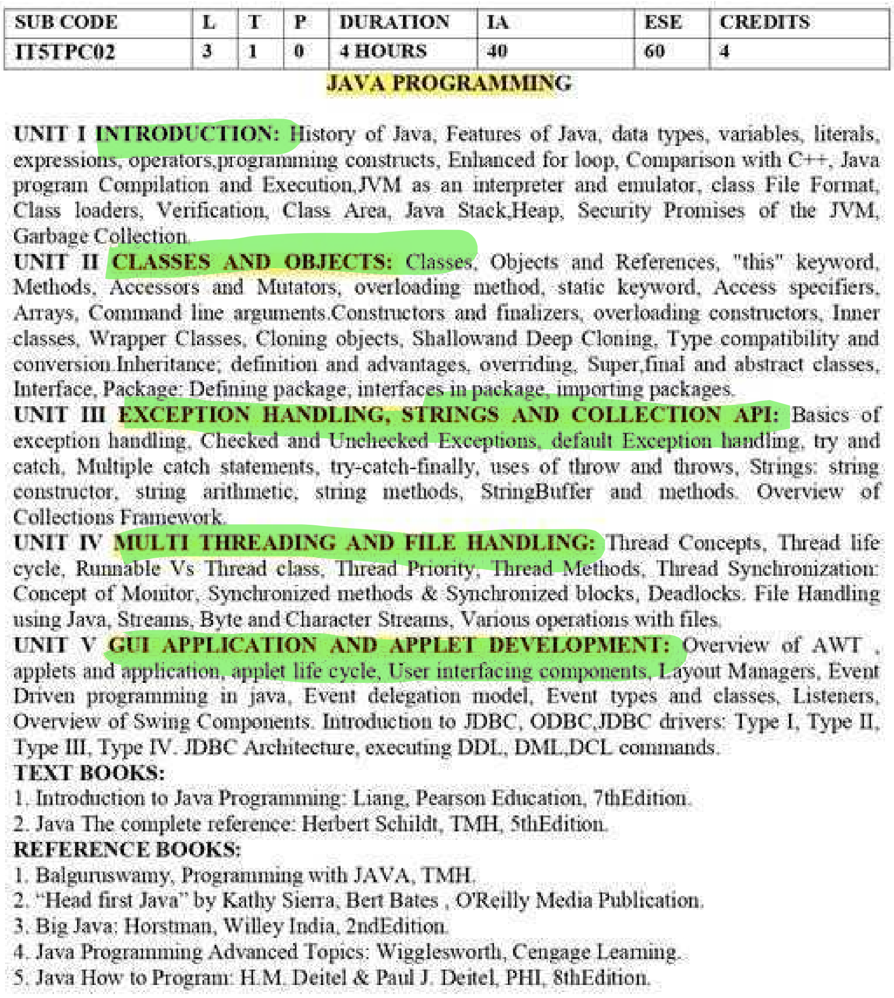
Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Multi version schemes, Recovery with concurrent transaction.

Text Books

1. Date C J, "An Introduction To Database System", Addision Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
3. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley
4. Leon & Leon, "Database Management System", Vikas Publishing House.

References Books

1. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication
2. Majumdar & Bhattacharya, "Database Management System", TMH
3. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill
4. Kroenke, "Database Processing: Fundamentals, Design and Implementation", Pearson Education.
5. Maheshwari Jain, "DBMS: Complete Practical Approach", Firewall Media, New Delhi



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPC02	3	1	0	4 HOURS	40	60	4

JAVA PROGRAMMING

UNIT I INTRODUCTION: History of Java, Features of Java, data types, variables, literals, expressions, operators,programming constructs, Enhanced for loop, Comparison with C++, Java program Compilation and Execution,JVM as an interpreter and emulator, class File Format, Class loaders, Verification, Class Area, Java Stack,Heap, Security Promises of the JVM, Garbage Collection.

UNIT II CLASSES AND OBJECTS: Classes, Objects and References, "this" keyword, Methods, Accessors and Mutators, overloading method, static keyword, Access specifiers, Arrays, Command line arguments.Constructors and finalizers, overloading constructors, Inner classes, Wrapper Classes, Cloning objects, Shallowand Deep Cloning, Type compatibility and conversion.Inheritance; definition and advantages, overriding, Super,final and abstract classes, Interface, Package: Defining package, interfaces in package, importing packages.

UNIT III EXCEPTION HANDLING, STRINGS AND COLLECTION API: Basics of exception handling, Checked and Unchecked Exceptions, default Exception handling, try and catch, Multiple catch statements, try-catch-finally, uses of throw and throws, Strings: string constructor, string arithmetic, string methods, StringBuffer and methods. Overview of Collections Framework.

UNIT IV MULTI THREADING AND FILE HANDLING: Thread Concepts, Thread life cycle, Runnable Vs Thread class, Thread Priority, Thread Methods, Thread Synchronization: Concept of Monitor, Synchronized methods & Synchronized blocks, Deadlocks. File Handling using Java, Streams, Byte and Character Streams, Various operations with files.

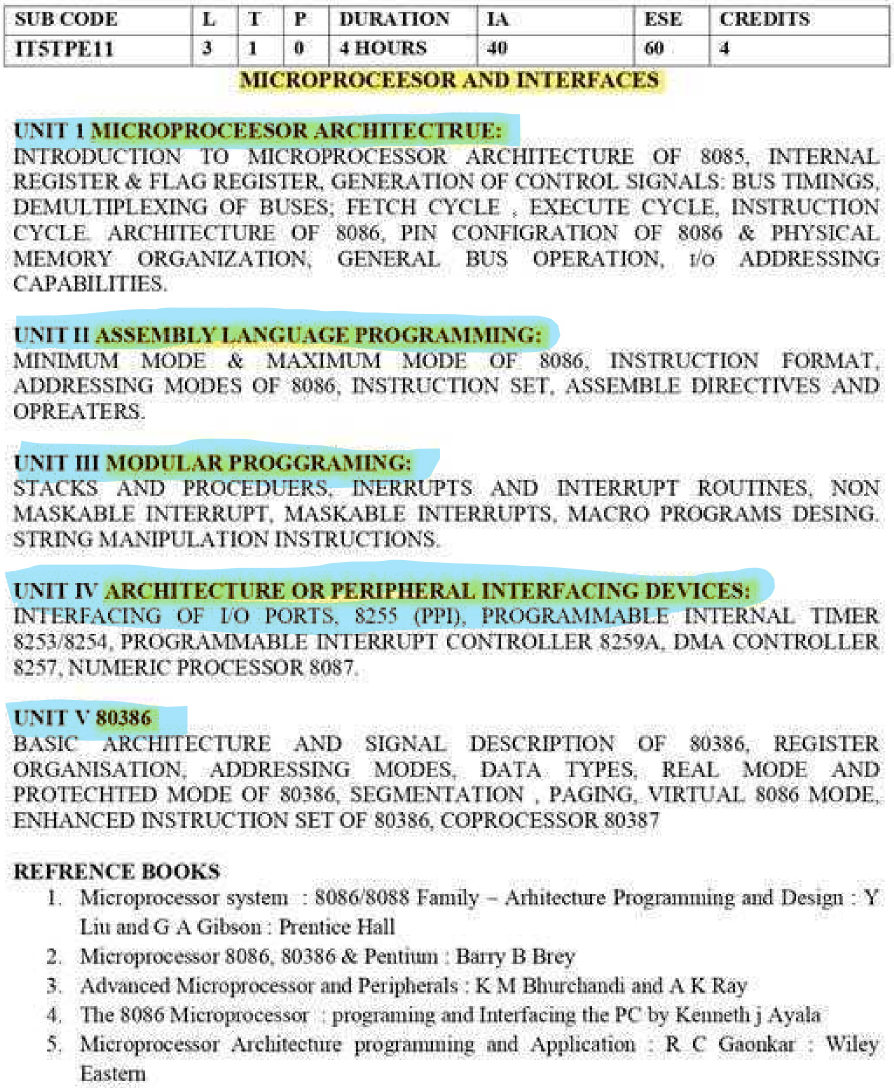
UNIT V GUI APPLICATION AND APPLET DEVELOPMENT: Overview of AWT , applets and application, applet life cycle, User interfacing components, Layout Managers, Event Driven programming in java, Event delegation model, Event types and classes, Listeners, Overview of Swing Components. Introduction to JDBC, ODBC,JDBC drivers: Type I, Type II, Type III, Type IV. JDBC Architecture, executing DDL, DML,DCL commands.

TEXT BOOKS:

1. Introduction to Java Programming: Liang, Pearson Education, 7thEdition.
2. Java The complete reference: Herbert Schildt, TMH, 5thEdition.

REFERENCE BOOKS:

1. Balguruswamy, Programming with JAVA, TMH.
2. “Head first Java” by Kathy Sierra, Bert Bates , O'Reilly Media Publication.
3. Big Java: Horstman, Willey India, 2ndEdition.
4. Java Programming Advanced Topics: Wigglesworth, Cengage Learning.
5. Java How to Program: H.M. Deitel & Paul J. Deitel, PHI, 8thEdition.



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPE11	3	1	0	4 HOURS	40	60	4

MICROPROCEESOR AND INTERFACES

UNIT 1 MICROPROCEESOR ARCHITECTRUE:

INTRODUCTION TO MICROPROCESSOR ARCHITECTURE OF 8085, INTERNAL REGISTER & FLAG REGISTER, GENERATION OF CONTROL SIGNALS: BUS TIMINGS, DEMULTIPLEXING OF BUSES; FETCH CYCLE , EXECUTE CYCLE, INSTRUCTION CYCLE. ARCHITECTURE OF 8086, PIN CONFIGRATION OF 8086 & PHYSICAL MEMORY ORGANIZATION, GENERAL BUS OPERATION, I/o ADDRESSING CAPABILITIES.

UNIT II ASSEMBLY LANGUAGE PROGRAMMING:

MINIMUM MODE & MAXIMUM MODE OF 8086, INSTRUCTION FORMAT, ADDRESSING MODES OF 8086, INSTRUCTION SET, ASSEMBLE DIRECTIVES AND OPREATERS.

UNIT III MODULAR PROGGRAMING:

STACKS AND PROCEDUERS, INERRUPTS AND INTERRUPT ROUTINES, NON MASKABLE INTERRUPT, MASKABLE INTERRUPTS, MACRO PROGRAMS DESING. STRING MANIPULATION INSTRUCTIONS.

UNIT IV ARCHITECTURE OR PERIPHERAL INTERFACING DEVICES:

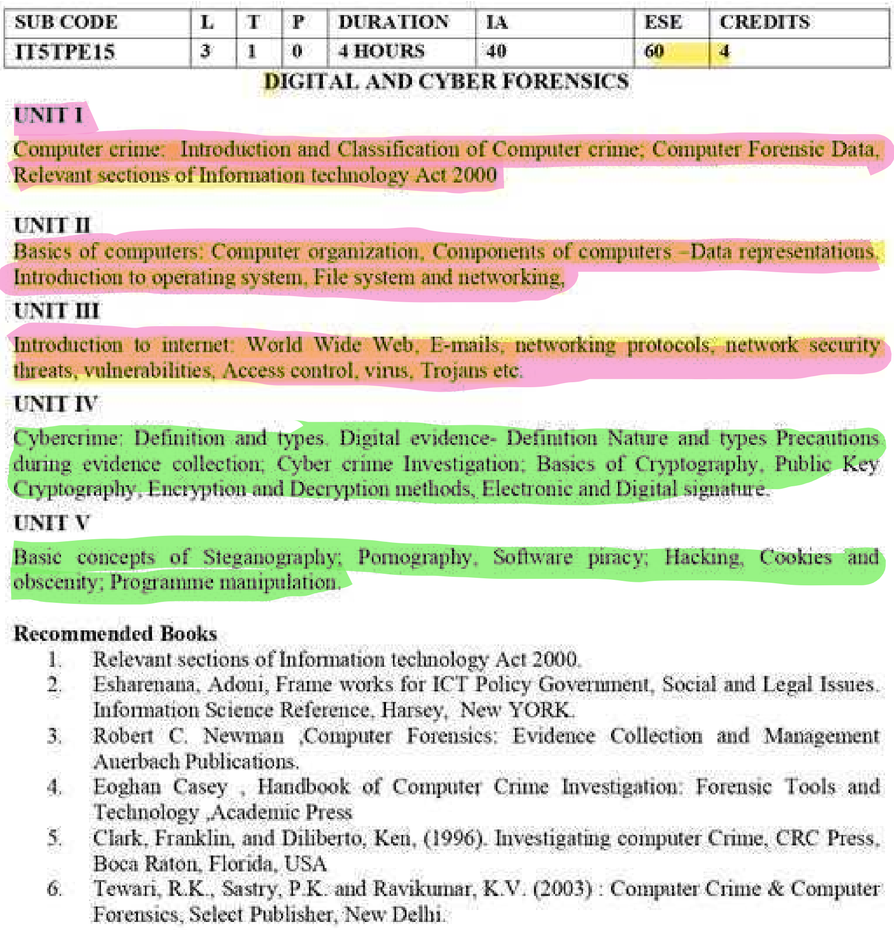
INTERFACING OF I/O PORTS, 8255 (PPI), PROGRAMMABLE INTERNAL TIMER 8253/8254, PROGRAMMABLE INTERRUPT CONTROLLER 8259A, DMA CONTROLLER 8257, NUMERIC PROCESSOR 8087.

UNIT V 80386

BASIC ARCHITECTURE AND SIGNAL DESCRIPTION OF 80386, REGISTER ORGANISATION, ADDRESSING MODES, DATA TYPES, REAL MODE AND PROTECHTED MODE OF 80386, SEGMENTATION , PAGING, VIRTUAL 8086 MODE, ENHANCED INSTRUCTION SET OF 80386, COPROCESSOR 80387

REFRENCE BOOKS

1. Microprocessor system : 8086/8088 Family – Arhitecture Programming and Design : Y Liu and G A Gibson : Prentice Hall
2. Microprocessor 8086, 80386 & Pentium : Barry B Brey
3. Advanced Microprocessor and Peripherals : K M Bhurchandi and A K Ray
4. The 8086 Microprocessor : programing and Interfacing the PC by Kenneth j Ayala
5. Microprocessor Architecture programming and Application : R C Gaonkar : Wiley Eastern



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPE15	3	1	0	4 HOURS	40	60	4

DIGITAL AND CYBER FORENSICS

UNIT I

Computer crime: Introduction and Classification of Computer crime; Computer Forensic Data, Relevant sections of Information technology Act 2000

UNIT II

Basics of computers: Computer organization, Components of computers –Data representations, Introduction to operating system, File system and networking,

UNIT III

Introduction to internet: World Wide Web, E-mails, networking protocols, network security threats, vulnerabilities, Access control, virus, Trojans etc.

UNIT IV

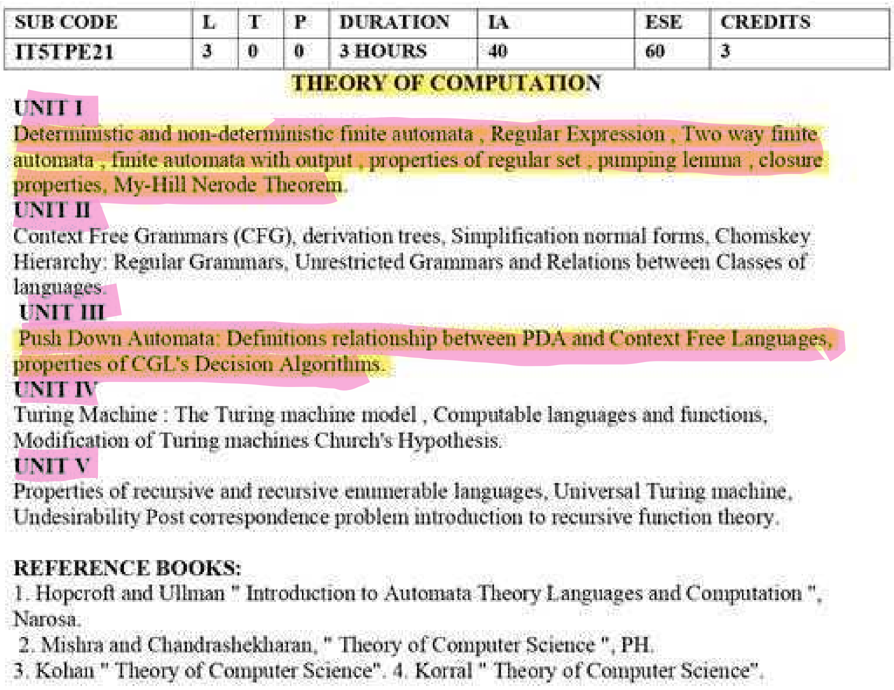
Cybercrime: Definition and types. Digital evidence- Definition Nature and types Precautions during evidence collection; Cyber crime Investigation; Basics of Cryptography, Public Key Cryptography, Encryption and Decryption methods, Electronic and Digital signature.

UNIT V

Basic concepts of Steganography; Pornography, Software piracy; Hacking, Cookies and obscenity; Programme manipulation.

Recommended Books

1. Relevant sections of Information technology Act 2000.
2. Esharenana, Adoni, Frame works for ICT Policy Government, Social and Legal Issues. Information Science Reference, Harsey, New YORK.
3. Robert C. Newman ,Computer Forensics: Evidence Collection and Management Auerbach Publications.
4. Eoghan Casey , Handbook of Computer Crime Investigation: Forensic Tools and Technology ,Academic Press
5. Clark, Franklin, and Diliberto, Ken, (1996). Investigating computer Crime, CRC Press, Boca Raton, Florida, USA
6. Tewari, R.K., Sastry, P.K. and Ravikumar, K.V. (2003) : Computer Crime & Computer Forensics, Select Publisher, New Delhi.



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPE21	3	0	0	3 HOURS	40	60	3

THEORY OF COMPUTATION

UNIT I

Deterministic and non-deterministic finite automata , Regular Expression , Two way finite automata , finite automata with output , properties of regular set , pumping lemma , closure properties, My-Hill Nerode Theorem.

UNIT II

Context Free Grammars (CFG), derivation trees, Simplification normal forms, Chomskey Hierarchy: Regular Grammars, Unrestricted Grammars and Relations between Classes of languages.

UNIT III

Push Down Automata: Definitions relationship between PDA and Context Free Languages, properties of CGL's Decision Algorithms.

UNIT IV

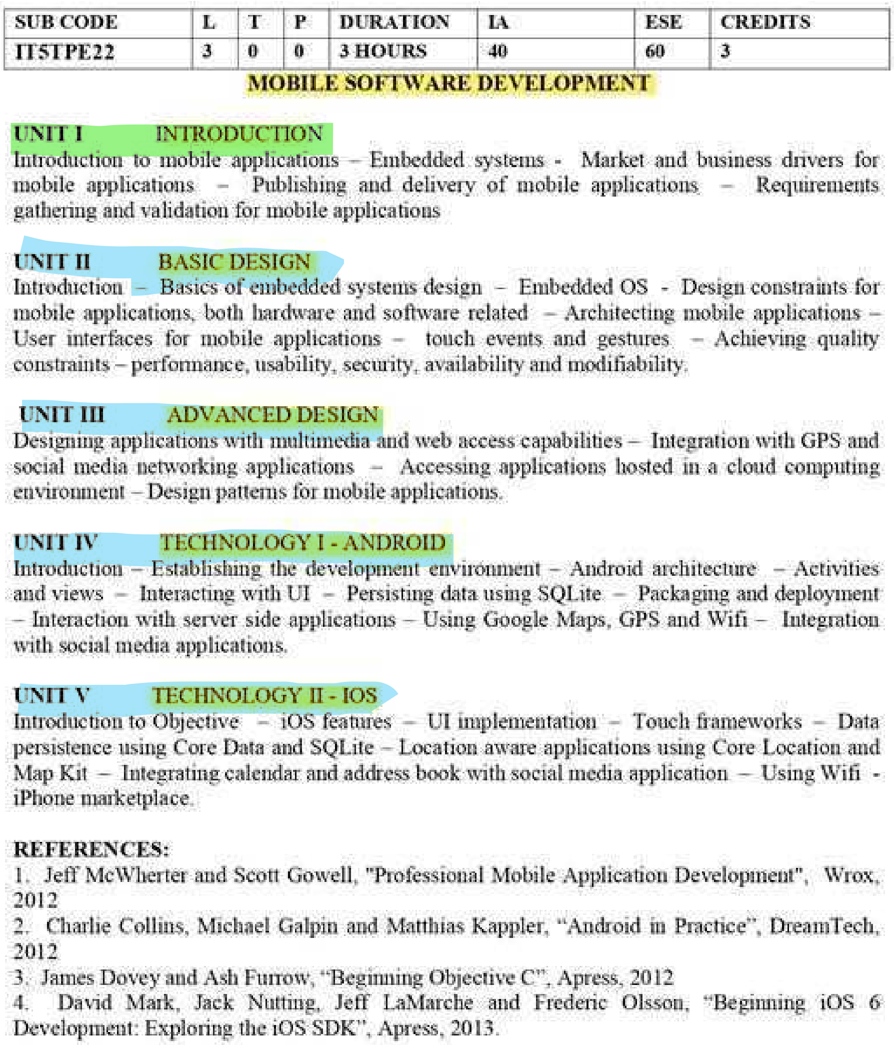
Turing Machine : The Turing machine model , Computable languages and functions, Modification of Turing machines Church's Hypothesis.

UNIT V

Properties of recursive and recursive enumerable languages, Universal Turing machine, Undesirability Post correspondence problem introduction to recursive function theory.

REFERENCE BOOKS:

1. Hopcroft and Ullman " Introduction to Automata Theory Languages and Computation ", Narosa.
2. Mishra and Chandrashekharan, " Theory of Computer Science ", PH.
3. Kohan " Theory of Computer Science". 4. Korral " Theory of Computer Science".



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPE22	3	0	0	3 HOURS	40	60	3

MOBILE SOFTWARE DEVELOPMENT

UNIT I INTRODUCTION

Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirements gathering and validation for mobile applications

UNIT II BASIC DESIGN

Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability.

UNIT III ADVANCED DESIGN

Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT IV TECHNOLOGY I - ANDROID

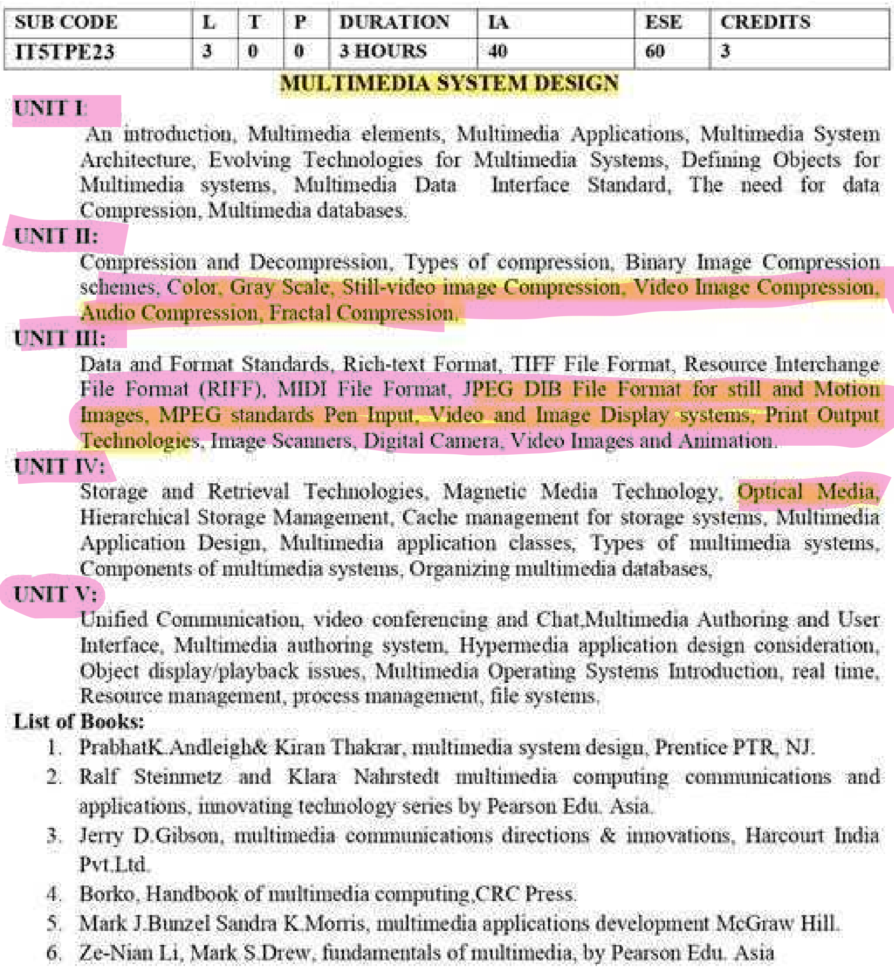
Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI – Persisting data using SQLite – Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS and Wifi – Integration with social media applications.

UNIT V TECHNOLOGY II - IOS

Introduction to Objective – iOS features – UI implementation – Touch frameworks – Data persistence using Core Data and SQLite – Location aware applications using Core Location and Map Kit – Integrating calendar and address book with social media application – Using Wifi - iPhone marketplace.

REFERENCES:

1. Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012
2. Charlie Collins, Michael Galpin and Matthias Kappler, "Android in Practice", DreamTech, 2012
3. James Dovey and Ash Furrow, "Beginning Objective C", Apress, 2012
4. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, "Beginning iOS 6 Development: Exploring the iOS SDK", Apress, 2013.



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPE23	3	0	0	3 HOURS	40	60	3

MULTIMEDIA SYSTEM DESIGN

UNIT I:

An introduction, Multimedia elements, Multimedia Applications, Multimedia System Architecture, Evolving Technologies for Multimedia Systems, Defining Objects for Multimedia systems, Multimedia Data Interface Standard, The need for data Compression, Multimedia databases.

UNIT II:

Compression and Decompression, Types of compression, Binary Image Compression schemes, Color, Gray Scale, Still-video image Compression, Video Image Compression, Audio Compression, Fractal Compression.

UNIT III:

Data and Format Standards, Rich-text Format, TIFF File Format, Resource Interchange File Format (RIFF), MIDI File Format, JPEG DIB File Format for still and Motion Images, MPEG standards Pen Input, Video and Image Display systems, Print Output Technologies, Image Scanners, Digital Camera, Video Images and Animation.

UNIT IV:

Storage and Retrieval Technologies, Magnetic Media Technology, Optical Media, Hierarchical Storage Management, Cache management for storage systems, Multimedia Application Design, Multimedia application classes, Types of multimedia systems, Components of multimedia systems, Organizing multimedia databases,

UNIT V:

Unified Communication, video conferencing and Chat,Multimedia Authoring and User Interface, Multimedia authoring system, Hypermedia application design consideration, Object display/playback issues, Multimedia Operating Systems Introduction, real time, Resource management, process management, file systems.

List of Books:

1. PrabhatK.Andleigh& Kiran Thakrar, multimedia system design, Prentice PTR, NJ.
2. Ralf Steinmetz and Klara Nahrstedt multimedia computing communications and applications, innovating technology series by Pearson Edu. Asia.
3. Jerry D.Gibson, multimedia communications directions & innovations, Harcourt India Pvt.Ltd.
4. Borko, Handbook of multimedia computing,CRC Press.
5. Mark J.Bunzel Sandra K.Morris, multimedia applications development McGraw Hill.
6. Ze-Nian Li, Mark S.Drew, fundamentals of multimedia, by Pearson Edu. Asia

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TPE24	3	0	0	3 HOURS	40	60	3

GRID AND CLOUD COMPUING

UNIT I
Cloud Computing, Cloud Architecture, Cloud Storage, Advantages and Disadvantages of Cloud Computing, Companies in the Cloud Today, Cloud Services, Web-Based Application, Ubiquitous computing, On-Demand Computing, Cloud Computing for the Community, Collaborating on Group Projects and Events, Cloud Computing for the Corporation.

UNIT II
Infrastructure as a Service: Introduction, Virtualization, Client and Server, Storage, RAID, IBM SAN, Infrastructure creation, Elastic Computing: Amazon Ec2, Computation Services, Case Study.

UNIT III
Platform as a Service: Microsoft AZURE, Google App Engine, Amazon Web Services, IBM Clouds, Software as a Service, IBM Websphere Cast Iron, Case studies.

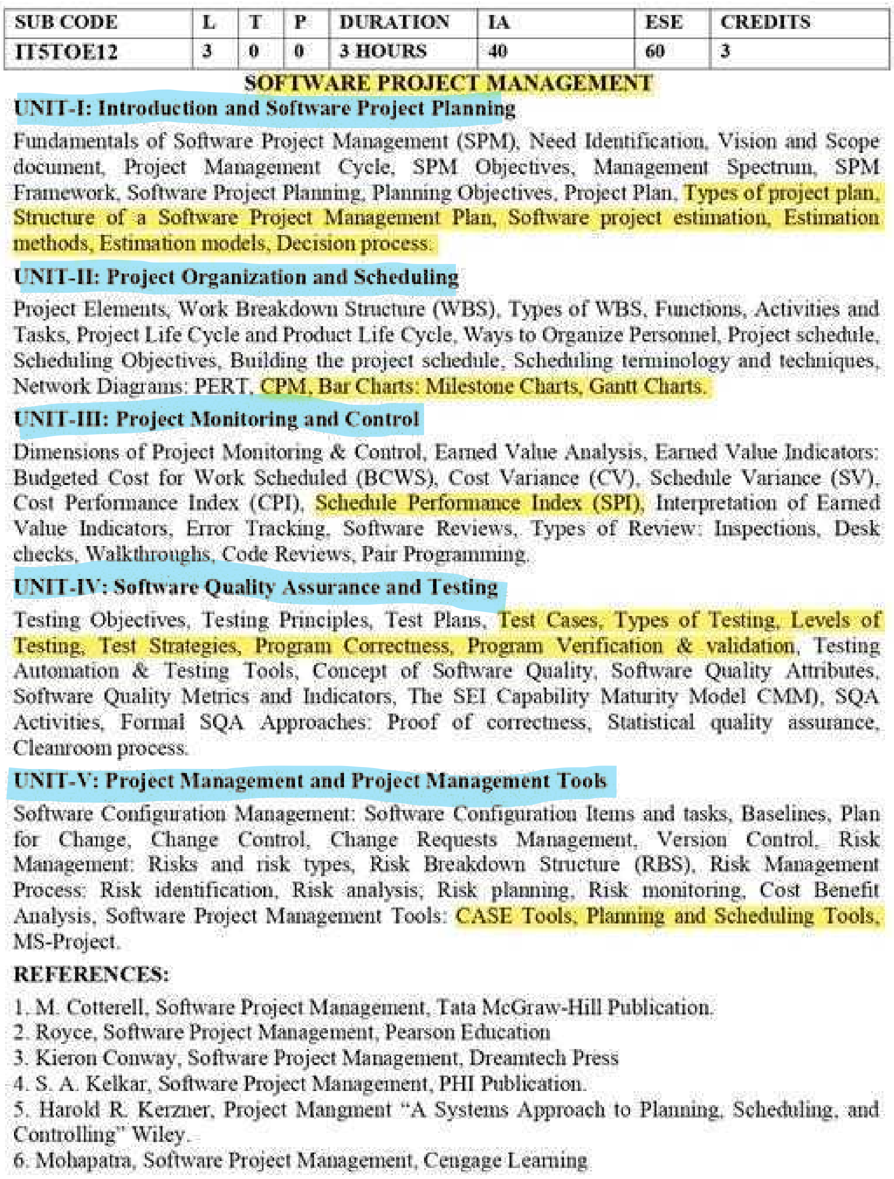
UNIT IV
MapReduce, GFS, Hadoop, HDFS, Bigdata, business perspectives, IBM Infosphere Biginsight, Analytics of BigData, Infosphere Streams.

UNIT V
Grid Computing: History, Definition, Types, Architecture and Goals Applications and Challenges of Grid Computing, Providers of Grid Computing. IBM Globus Toolkit, Grid Security Infrastructure, Open Grid Service Architecture.

List of Books:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing.

Viktors Berstis , Grid Computing : IBM Red Book
Understanding Bigdata, by Paul C. Zikopoulos et al. McGrawHill,
"Introduction to Grid Computing with Globus", Luis Ferreira et al. IBM Red Books



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IT5TOE12	3	0	0	3 HOURS	40	60	3

SOFTWARE PROJECT MANAGEMENT

UNIT-I: Introduction and Software Project Planning

Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

UNIT-II: Project Organization and Scheduling

Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

UNIT-III: Project Monitoring and Control

Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Desk checks, Walkthroughs, Code Reviews, Pair Programming.

UNIT-IV: Software Quality Assurance and Testing

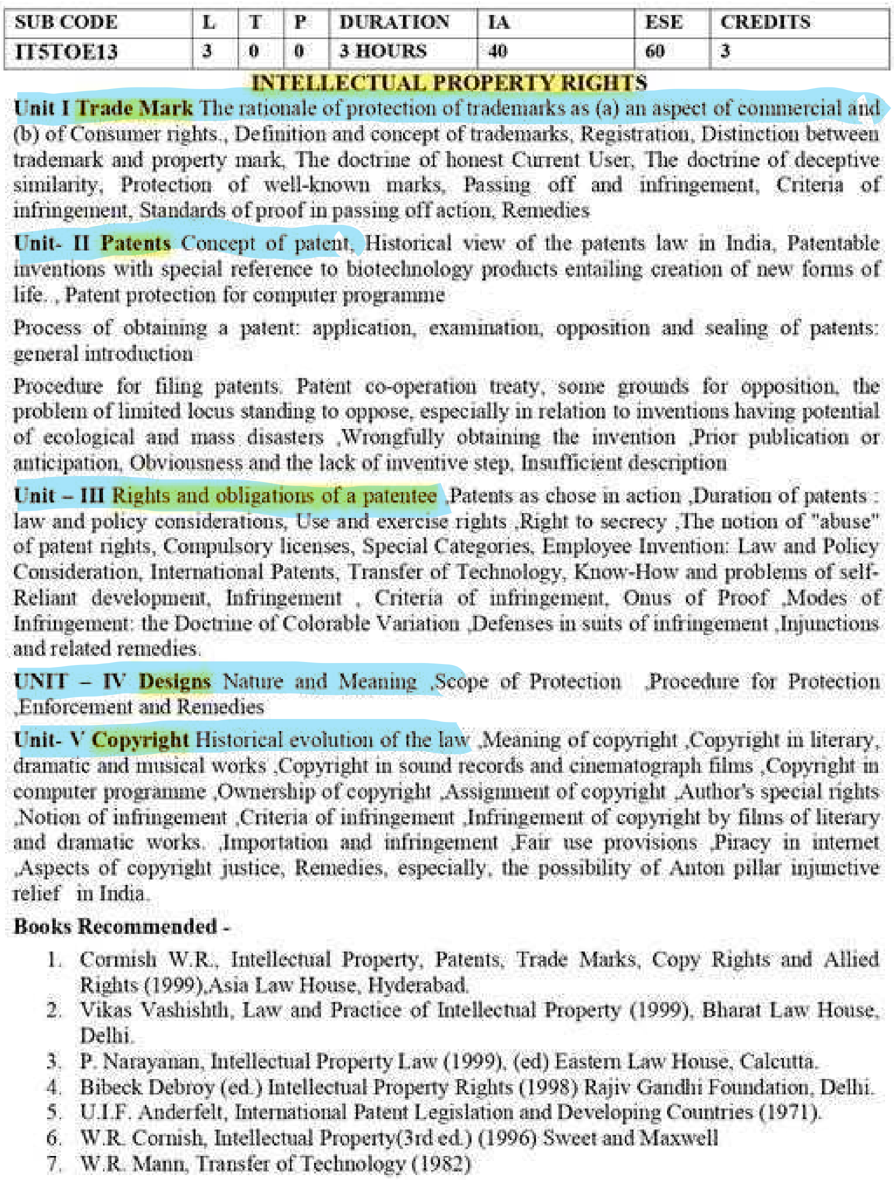
Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process.

UNIT-V: Project Management and Project Management Tools

Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.

REFERENCES:

1. M. Cotterell, Software Project Management, Tata McGraw-Hill Publication.
2. Royce, Software Project Management, Pearson Education
3. Kieron Conway, Software Project Management, Dreamtech Press
4. S. A. Kelkar, Software Project Management, PHI Publication.
5. Harold R. Kerzner, Project Mangment "A Systems Approach to Planning, Scheduling, and Controlling" Wiley.
6. Mohapatra, Software Project Management, Cengage Learning



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TOE13	3	0	0	3 HOURS	40	60	3

INTELLECTUAL PROPERTY RIGHTS

Unit I Trade Mark The rationale of protection of trademarks as (a) an aspect of commercial and (b) of Consumer rights., Definition and concept of trademarks, Registration, Distinction between trademark and property mark, The doctrine of honest Current User, The doctrine of deceptive similarity, Protection of well-known marks, Passing off and infringement, Criteria of infringement, Standards of proof in passing off action, Remedies

Unit- II Patents Concept of patent, Historical view of the patents law in India, Patentable inventions with special reference to biotechnology products entailing creation of new forms of life., Patent protection for computer programme

Process of obtaining a patent: application, examination, opposition and sealing of patents: general introduction

Procedure for filing patents. Patent co-operation treaty, some grounds for opposition, the problem of limited locus standing to oppose, especially in relation to inventions having potential of ecological and mass disasters ,Wrongfully obtaining the invention ,Prior publication or anticipation, Obviousness and the lack of inventive step, Insufficient description

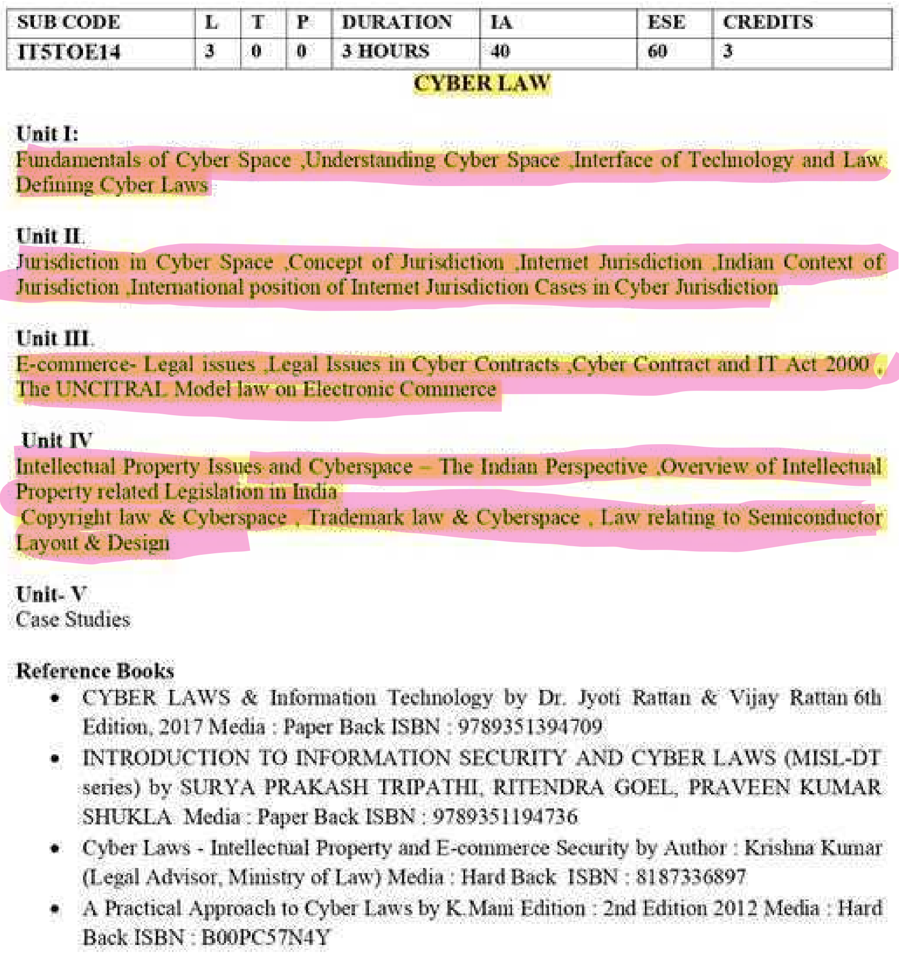
Unit – III Rights and obligations of a patentee ,Patents as chose in action ,Duration of patents : law and policy considerations, Use and exercise rights ,Right to secrecy ,The notion of "abuse" of patent rights, Compulsory licenses, Special Categories, Employee Invention: Law and Policy Consideration, International Patents, Transfer of Technology, Know-How and problems of self-Reliant development, Infringement , Criteria of infringement, Onus of Proof ,Modes of Infringement: the Doctrine of Colorable Variation ,Defenses in suits of infringement ,Injunctions and related remedies.

UNIT – IV Designs Nature and Meaning ,Scope of Protection ,Procedure for Protection ,Enforcement and Remedies

Unit- V Copyright Historical evolution of the law ,Meaning of copyright ,Copyright in literary, dramatic and musical works ,Copyright in sound records and cinematograph films ,Copyright in computer programme ,Ownership of copyright ,Assignment of copyright ,Author's special rights ,Notion of infringement ,Criteria of infringement ,Infringement of copyright by films of literary and dramatic works. ,Importation and infringement ,Fair use provisions ,Piracy in internet ,Aspects of copyright justice, Remedies, especially, the possibility of Anton pillar injunctive relief in India.

Books Recommended -

1. Cormish W.R., Intellectual Property, Patents, Trade Marks, Copy Rights and Allied Rights (1999),Asia Law House, Hyderabad.
2. Vikas Vashishth, Law and Practice of Intellectual Property (1999), Bharat Law House, Delhi.
3. P. Narayanan, Intellectual Property Law (1999), (ed) Eastern Law House, Calcutta.
4. Bibeck Debroy (ed.) Intellectual Property Rights (1998) Rajiv Gandhi Foundation, Delhi.
5. U.I.F. Anderfelt, International Patent Legislation and Developing Countries (1971).
6. W.R. Cornish, Intellectual Property(3rd ed.) (1996) Sweet and Maxwell
7. W.R. Mann, Transfer of Technology (1982)



SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TOE14	3	0	0	3 HOURS	40	60	3

CYBER LAW

Unit I:

Fundamentals of Cyber Space ,Understanding Cyber Space ,Interface of Technology and Law Defining Cyber Laws

Unit II.

Jurisdiction in Cyber Space ,Concept of Jurisdiction ,Internet Jurisdiction ,Indian Context of Jurisdiction ,International position of Internet Jurisdiction Cases in Cyber Jurisdiction

Unit III.

E-commerce- Legal issues ,Legal Issues in Cyber Contracts ,Cyber Contract and IT Act 2000 , The UNCITRAL Model law on Electronic Commerce

Unit IV

Intellectual Property Issues and Cyberspace – The Indian Perspective ,Overview of Intellectual Property related Legislation in India

Copyright law & Cyberspace , Trademark law & Cyberspace , Law relating to Semiconductor Layout & Design

Unit- V

Case Studies

Reference Books

- CYBER LAWS & Information Technology by Dr. Jyoti Rattan & Vijay Rattan 6th Edition, 2017 Media : Paper Back ISBN : 9789351394709
- INTRODUCTION TO INFORMATION SECURITY AND CYBER LAWS (MISL-DT series) by SURYA PRAKASH TRIPATHI, RITENDRA GOEL, PRAVEEN KUMAR SHUKLA Media : Paper Back ISBN : 9789351194736
- Cyber Laws - Intellectual Property and E-commerce Security by Author : Krishna Kumar (Legal Advisor, Ministry of Law) Media : Hard Back ISBN : 8187336897
- A Practical Approach to Cyber Laws by K.Mani Edition : 2nd Edition 2012 Media : Hard Back ISBN : B00PC57N4Y

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT5TOE15	3	0	0	3 HOURS	40	60	3

ANALYSIS AND DESIGN OF ALGORITHM

UNIT I Performance Analysis

Space and Time Complexity, Asymptotic Notations. Divide and Conquer: Finding Maxima and Minima Binary search, Merge Sort, Quick Sort, and selection sort.

UNIT II Greedy Method and Dynamic Programming

Knapsack problem and Minimum Spanning trees, Dynamic Programming: Rod Cutting Problem, Longest Common Subsequence Problem, All pair's shortest path, optimal binary search tree,

UNIT III SEARCH TECHNIQUES

Techniques for binary trees, techniques for graphs –DES and BFS, connected components and spanning tree, Bi-connected components and DFS. Backtracking: The 8-queen problem, graph coloring , Hamiltonian cycles.

UNIT IV BRANCH AND BOUND

O/1 knapsack problem, traveling sales person problem, efficiency consideration, Algebraic Problems, lower Bound theory.

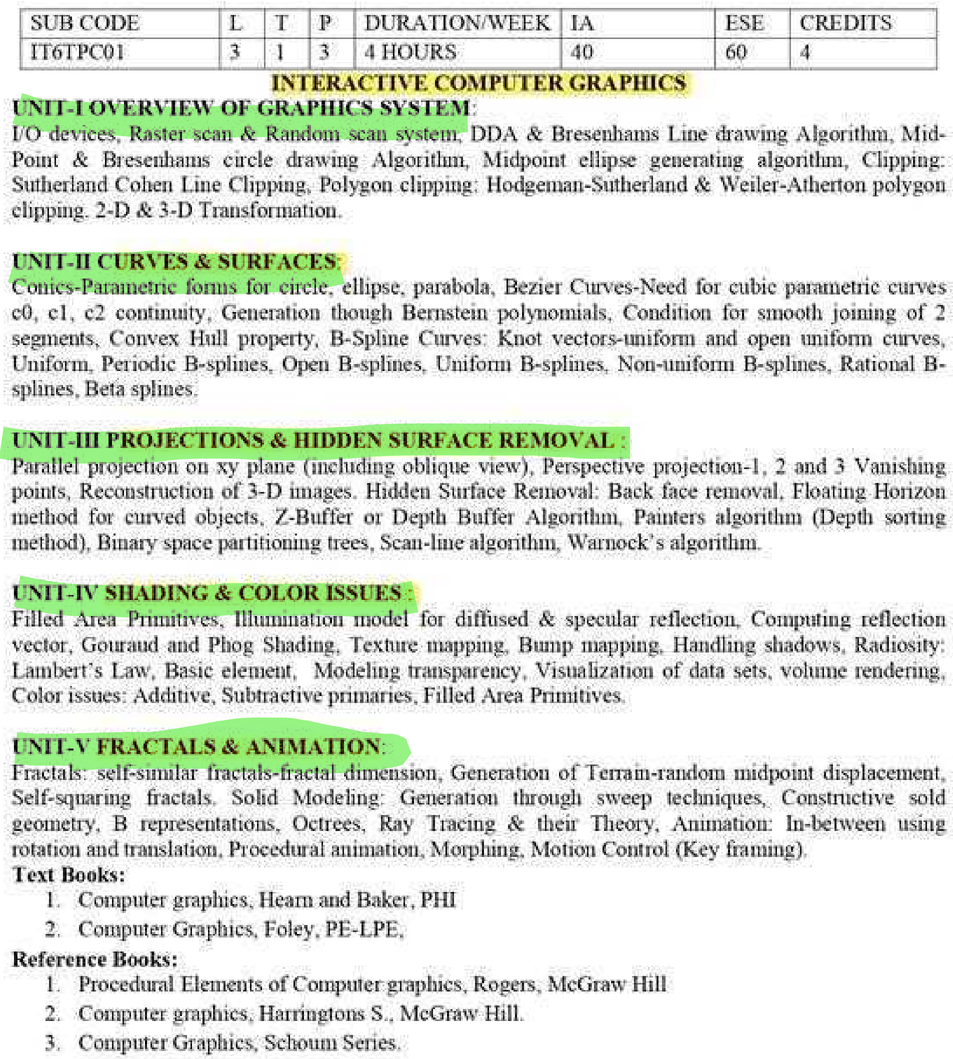
UNIT V NP HARD AND NP COMPLETE PROBLEM

Basic concepts, problem classes, P, NP, NP hard, NP complete problem, deterministic and non-deterministic Polynomial time algorithm

REFERENCE BOOKS:

1. Horowitz E & sahani s, "Fundamentals of Computer algorithms" , Galgotia.
2. Aho , Hopcroft & Ullman , "the design and Analysis of computer Algorithms" Addison Wesely
3. Sedgewick , "Algorithms in C"

************End of V Sem Scheme & Syllabus****************



SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPC01	3	1	3	4 HOURS	40	60	4

INTERACTIVE COMPUTER GRAPHICS

UNIT-I OVERVIEW OF GRAPHICS SYSTEM:

I/O devices, Raster scan & Random scan system, DDA & Bresenhams Line drawing Algorithm, Mid-Point & Bresenhams circle drawing Algorithm, Midpoint ellipse generating algorithm, Clipping: Sutherland Cohen Line Clipping, Polygon clipping: Hodgeman-Sutherland & Weiler-Atherton polygon clipping. 2-D & 3-D Transformation.

UNIT-II CURVES & SURFACES:

Conics-Parametric forms for circle, ellipse, parabola, Bezier Curves-Need for cubic parametric curves c0, c1, c2 continuity, Generation though Bernstein polynomials, Condition for smooth joining of 2 segments, Convex Hull property, B-Spline Curves: Knot vectors-uniform and open uniform curves, Uniform, Periodic B-splines, Open B-splines, Uniform B-splines, Non-uniform B-splines, Rational B-splines, Beta splines.

UNIT-III PROJECTIONS & HIDDEN SURFACE REMOVAL :

Parallel projection on xy plane (including oblique view), Perspective projection-1, 2 and 3 Vanishing points, Reconstruction of 3-D images. Hidden Surface Removal: Back face removal, Floating Horizon method for curved objects, Z-Buffer or Depth Buffer Algorithm, Painters algorithm (Depth sorting method), Binary space partitioning trees, Scan-line algorithm, Warnock's algorithm.

UNIT-IV SHADING & COLOR ISSUES :

Filled Area Primitives, Illumination model for diffused & specular reflection, Computing reflection vector, Gouraud and Phog Shading, Texture mapping, Bump mapping, Handling shadows, Radiosity: Lambert's Law, Basic element, Modeling transparency, Visualization of data sets, volume rendering, Color issues: Additive, Subtractive primaries, Filled Area Primitives.

UNIT-V FRACTALS & ANIMATION:

Fractals: self-similar fractals-fractal dimension, Generation of Terrain-random midpoint displacement, Self-squaring fractals. Solid Modeling: Generation through sweep techniques, Constructive sold geometry, B representations, Octrees, Ray Tracing & their Theory, Animation: In-between using rotation and translation, Procedural animation, Morphing, Motion Control (Key framing).

Text Books:

1. Computer graphics, Hearn and Baker, PHI
2. Computer Graphics, Foley, PE-LPE,

Reference Books:

1. Procedural Elements of Computer graphics, Rogers, McGraw Hill
2. Computer graphics, Harringtons S., McGraw Hill.
3. Computer Graphics, Schoum Series.

SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPC02	3	1	0	4 HOURS	40	60	4

OPERATING SYSTEM

UNIT I INTRODUCTION TO OPERATING SYSTEM :

objective and function . The evaluation of the operating system , system components operating system services , system structure ,batch interactive , time sharing and real time operating system , Protection. File system : File concepts , file organization and access mechanism , directory.

UNIT II CONCURRENT PROCESS :

Process concepts , principal of concurrency . the producer consumer problem , the critical section problem , semaphore, classical problem in concurrency , inter process communication , process generation , process scheduling .

UNIT III CPU SCHEDULING :

scheduling concepts, performance criteria scheduling algorithms. algorithm evaluation , multiprocessor scheduling.I/O management and Disk scheduling I/O devices and organization of the I/O functions. I/O buffering disk I/O operating system design issues.

UNIT IV DEAD LOCKS :

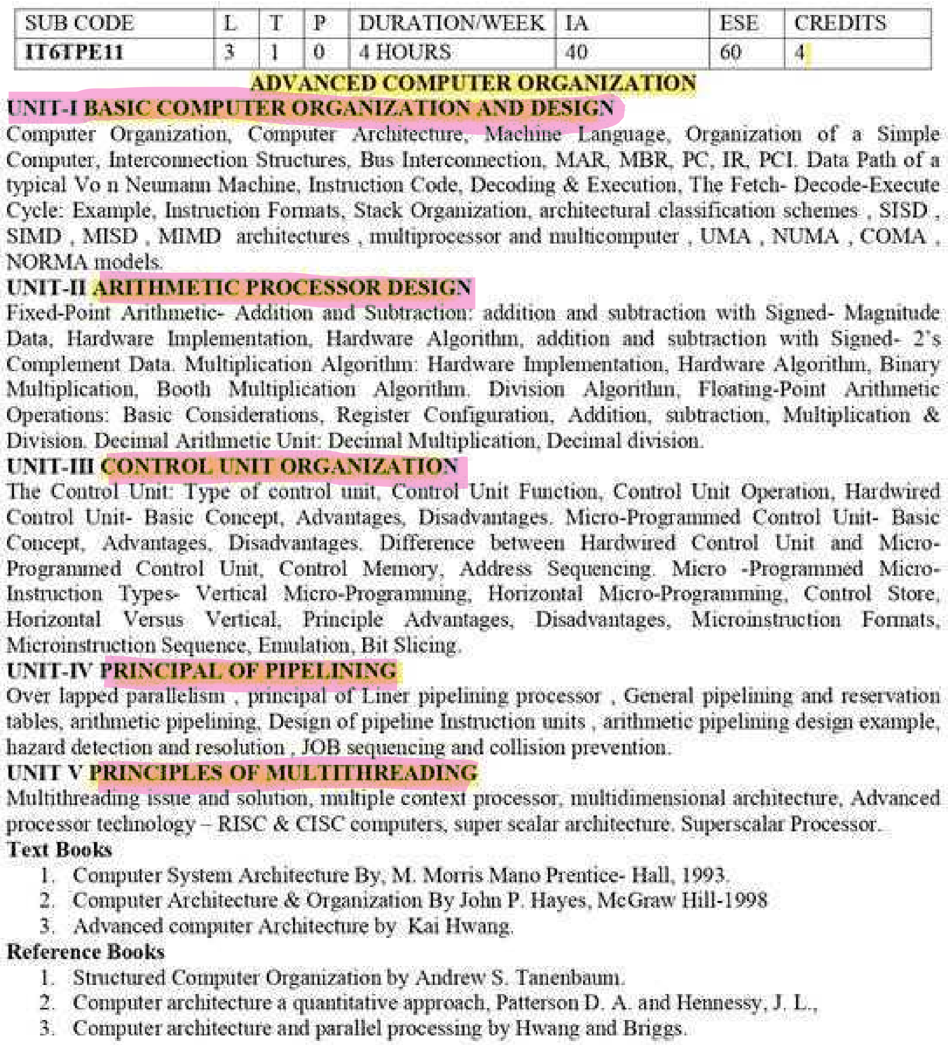
system models, deadlock characterization , prevention , avoidance and detection recovery from deadlock , combined approach.

UNIT V MEMORY MANAGEMENT :

Base machine , Residence monitor , multiprogramming with fixed partition , multiprogramming with variable partitions, multiple base register, paging, segmentation, paging segmentation, virtual memory concepts , demand paging performance , page replacement algorithms , allocation of frames, thrashing , cache memory organization impact on performance .

Reference Books

1. Milenkovic M. , "Operating System concepts", MGH
2. Tanenbaubm A. S. "Operating System design and implementation" , PHI
3. Silberschartz A.and Patterson J.I. , " Operating system concepts", Wisley.
4. Stilling William " Operating System ", Maxwell McMillan International Edition 1992. Dectel H.N. , "An introduction to operating system ", Addision Wisley.



SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPE11	3	1	0	4 HOURS	40	60	4

ADVANCED COMPUTER ORGANIZATION

UNIT-I BASIC COMPUTER ORGANIZATION AND DESIGN

Computer Organization, Computer Architecture, Machine Language, Organization of a Simple Computer, Interconnection Structures, Bus Interconnection, MAR, MBR, PC, IR, PCI. Data Path of a typical Vo n Neumann Machine, Instruction Code, Decoding & Execution, The Fetch- Decode-Execute Cycle: Example, Instruction Formats, Stack Organization, architectural classification schemes , SISD , SIMD , MISD , MIMD architectures , multiprocessor and multicomputer , UMA , NUMA , COMA , NORMA models.

UNIT-II ARITHMETIC PROCESSOR DESIGN

Fixed-Point Arithmetic- Addition and Subtraction: addition and subtraction with Signed- Magnitude Data, Hardware Implementation, Hardware Algorithm, addition and subtraction with Signed- 2's Complement Data. Multiplication Algorithm: Hardware Implementation, Hardware Algorithm, Binary Multiplication, Booth Multiplication Algorithm. Division Algorithm, Floating-Point Arithmetic Operations: Basic Considerations, Register Configuration, Addition, subtraction, Multiplication & Division. Decimal Arithmetic Unit: Decimal Multiplication, Decimal division.

UNIT-III CONTROL UNIT ORGANIZATION

The Control Unit: Type of control unit, Control Unit Function, Control Unit Operation, Hardwired Control Unit- Basic Concept, Advantages, Disadvantages. Micro-Programmed Control Unit- Basic Concept, Advantages, Disadvantages. Difference between Hardwired Control Unit and Micro-Programmed Control Unit, Control Memory, Address Sequencing. Micro -Programmed Micro-Instruction Types- Vertical Micro-Programming, Horizontal Micro-Programming, Control Store, Horizontal Versus Vertical, Principle Advantages, Disadvantages, Microinstruction Formats, Microinstruction Sequence, Emulation, Bit Slicing.

UNIT-IV PRINCIPAL OF PIPELINING

Over lapped parallelism , principal of Liner pipelining processor , General pipelining and reservation tables, arithmetic pipelining, Design of pipeline Instruction units , arithmetic pipelining design example, hazard detection and resolution , JOB sequencing and collision prevention.

UNIT V PRINCIPLES OF MULTITHREADING

Multithreading issue and solution, multiple context processor, multidimensional architecture, Advanced processor technology – RISC & CISC computers, super scalar architecture. Superscalar Processor.

Text Books

1. Computer System Architecture By, M. Morris Mano Prentice- Hall, 1993.
2. Computer Architecture & Organization By John P. Hayes, McGraw Hill-1998
3. Advanced computer Architecture by Kai Hwang.

Reference Books

1. Structured Computer Organization by Andrew S. Tanenbaum.
2. Computer architecture a quantitative approach, Patterson D. A. and Hennessy, J. L.,
3. Computer architecture and parallel processing by Hwang and Briggs.

SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPE12	3	1	0	4 HOURS	40	60	4

SIMULATIONS & MODELING

Unit 1 Introduction to Simulation: Discrete and Continuous Systems, Model of a System, Types of Models, Discrete –Event System Simulation, Steps in a Simulation Study.
System Studies: Subsystems, A Corporate Model, Environment Segment. Production Segment, Management Segment, The Full Corporate Model, Types of System Study, System Analysis, System Design, System Postulation.

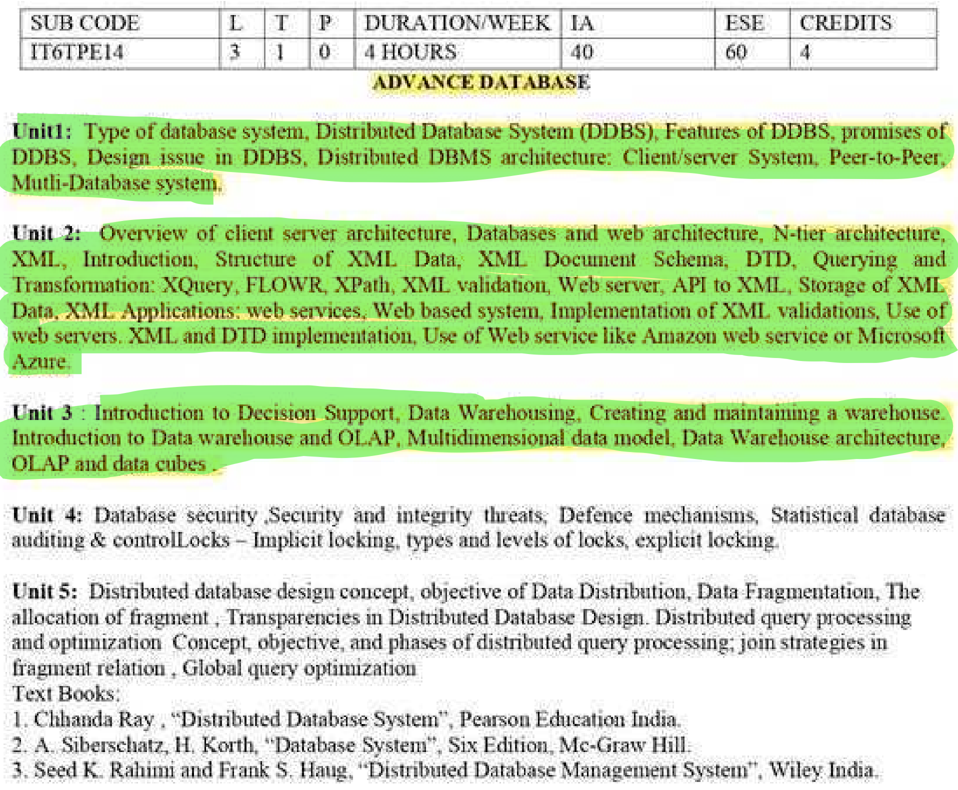
Unit 2 System Simulation: The Technique of Simulation, The Monte Carlo Method, Comparison of Simulation and Analytical Methods, Experimental Nature of Simulation, Types of System Simulation, Numerical Computation Techniques for Continuous Models, Distributed Lag Models, Cobweb Models.
System Dynamics: Exponential Growth Models, Exponential Decay Models, Modified Exponential Growth Models, Logistic Curves, System Dynamics Diagrams, Simple System Dynamics Diagrams, Multi-Segment Models, Representation of Time Delays.

Unit 3 Probability Concepts in Simulation: Stochastic Variables, Discrete Probability Functions, Continuous Probability Functions, Measures of Probability Functions, Numerical Evaluation of Continuous Probability Functions, Continuous Uniformly Distributed Random Numbers, Computer Generation of Random Numbers, A Uniform Random Number Generator , Generating Discrete Distributions, Non-Uniform Continuously Distributed Random Numbers, The Rejection Method.

Unit 4 Arrival Patterns and Service Times: Congestion in Systems. Arrival Patterns, Poisson Arrival Patterns, The Exponential Distribution, The Coefficient of Variation, The Erlang Distribution, The Hper-Exponential Distribution, Service Times, The Normal Distribution, Queuing Disciplines, Queuing notation, Measures of Queues, Mathematical Solutions of Queuing Problems.

Unit 5 Discrete System Simulation: Discrete Events, Representation of Time, Generation of Arrival Patterns, Simulation of a Telephone System, Delayed Calls, Simulation Programming Tasks, Gathering Statistics, Counters and Summary Statistics, Measuring Utilization and Occupancy, Recording Distribution and Transit Times, Discrete Simulation Languages.
Input Modeling: Data Collection, Identifying the Distribution with Data, Parameter Estimation, Selecting Input Models without Data.
Simulation Software: Simulation in C++, Simulation in GPSS.
Reference Books:-

- System Modeling & Simulation – V.P. Singh- New Age Publishing



SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPE14	3	1	0	4 HOURS	40	60	4

ADVANCE DATABASE

Unit1: Type of database system, Distributed Database System (DDBS), Features of DDBS, promises of DDBS, Design issue in DDBS, Distributed DBMS architecture: Client/server System, Peer-to-Peer, Mutli-Database system.

Unit 2: Overview of client server architecture, Databases and web architecture, N-tier architecture, XML, Introduction, Structure of XML Data, XML Document Schema, DTD, Querying and Transformation: XQuery, FLOWR, XPath, XML validation, Web server, API to XML, Storage of XML Data, XML Applications: web services, Web based system, Implementation of XML validations, Use of web servers. XML and DTD implementation, Use of Web service like Amazon web service or Microsoft Azure.

Unit 3 : Introduction to Decision Support, Data Warehousing, Creating and maintaining a warehouse. Introduction to Data warehouse and OLAP, Multidimensional data model, Data Warehouse architecture, OLAP and data cubes .

Unit 4: Database security ,Security and integrity threats, Defence mechanisms, Statistical database auditing & controlLocks – Implicit locking, types and levels of locks, explicit locking.

Unit 5: Distributed database design concept, objective of Data Distribution, Data Fragmentation, The allocation of fragment , Transparencies in Distributed Database Design. Distributed query processing and optimization Concept, objective, and phases of distributed query processing; join strategies in fragment relation , Global query optimization

Text Books:

1. Chhanda Ray , "Distributed Database System", Pearson Education India.
2. A. Siberschatz, H. Korth, "Database System", Six Edition, Mc-Graw Hill.
3. Seed K. Rahimi and Frank S. Haug, "Distributed Database Management System", Wiley India.

SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPE21	3	0	0	3 HOURS	40	60	3

PARALLEL COMPUTING

UNIT I SCALABILITY AND CLUSTERING Evolution of Computer Architecture – Dimensions of Scalability – Parallel Computer Models – Basic Concepts Of Clustering – Scalable Design Principles – Parallel Programming Overview – Processes, Tasks and Threads – Parallelism Issues – Interaction / Communication Issues – Semantic Issues In Parallel Programs.

UNIT II ENABLING TECHNOLOGIES System Development Trends – Principles of Processor Design – Microprocessor Architecture Families – Hierarchical Memory Technology – Cache Coherence Protocols – Shared Memory Consistency – Distributed Cache Memory Architecture – Latency Tolerance Techniques – Multithreaded Latency Hiding.

UNIT III SYSTEM INTERCONNECTS Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT IV PARALLEL PROGRAMMING Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

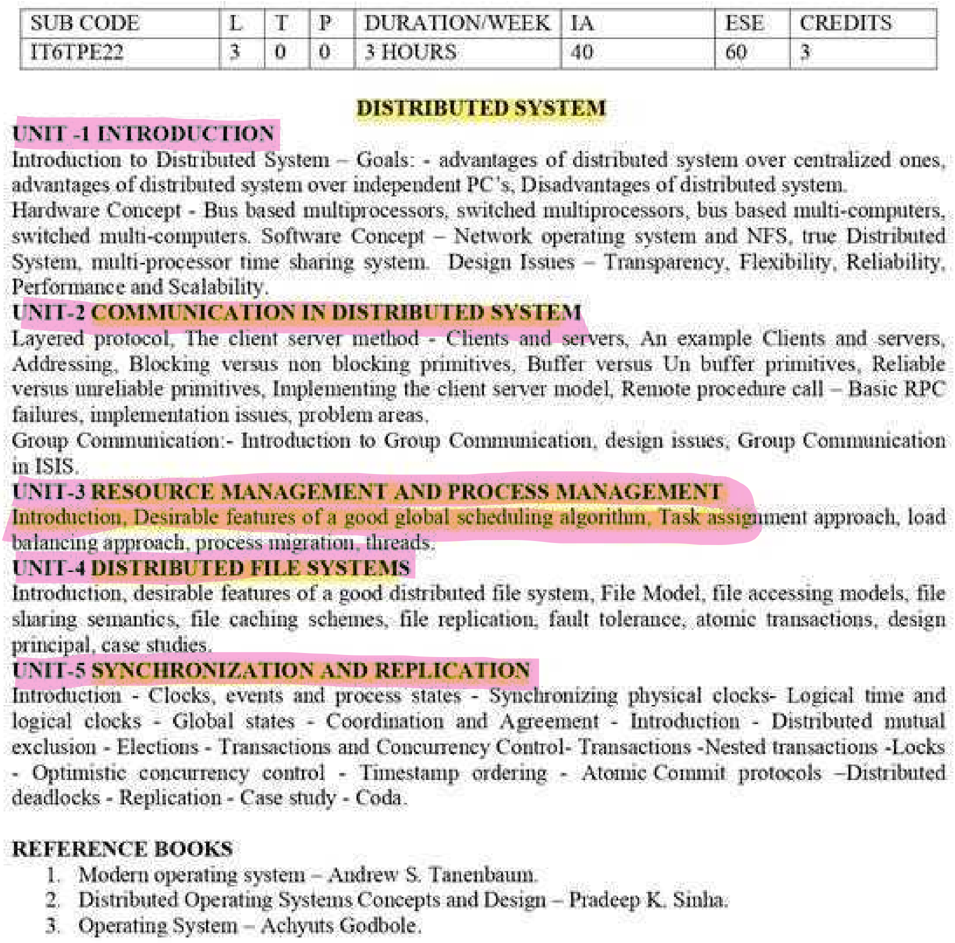
UNIT V MESSAGE PASSING PROGRAMMING Message Passing Paradigm – Message Passing Interface – Parallel Virtual Machine.

TEXT BOOK

1. Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata McGraw-Hill, New Delhi, 2003.

REFERENCES

1. David E. Culler & Jaswinder Pal Singh, "Parallel Computing Architecture: A Hardware/Software Approach", Morgan Kaufman Publishers, 1999.
2. Michael J. Quinn, "Parallel Programming in C with MPI & OpenMP", Tata McGraw-Hill, New Delhi, 2003.
3. Kai Hwang, "Advanced Computer Architecture" Tata McGraw-Hill, New Delhi, 2003.



SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPE22	3	0	0	3 HOURS	40	60	3

DISTRIBUTED SYSTEM

UNIT -1 INTRODUCTION

Introduction to Distributed System – Goals: - advantages of distributed system over centralized ones, advantages of distributed system over independent PC's, Disadvantages of distributed system.

Hardware Concept - Bus based multiprocessors, switched multiprocessors, bus based multi-computers, switched multi-computers. Software Concept – Network operating system and NFS, true Distributed System, multi-processor time sharing system. Design Issues – Transparency, Flexibility, Reliability, Performance and Scalability.

UNIT-2 COMMUNICATION IN DISTRIBUTED SYSTEM

Layered protocol, The client server method - Clients and servers, An example Clients and servers, Addressing, Blocking versus non blocking primitives, Buffer versus Un buffer primitives, Reliable versus unreliable primitives, Implementing the client server model, Remote procedure call – Basic RPC failures, implementation issues, problem areas.

Group Communication:- Introduction to Group Communication, design issues, Group Communication in ISIS.

UNIT-3 RESOURCE MANAGEMENT AND PROCESS MANAGEMENT

Introduction, Desirable features of a good global scheduling algorithm, Task assignment approach, load balancing approach, process migration, threads.

UNIT-4 DISTRIBUTED FILE SYSTEMS

Introduction, desirable features of a good distributed file system, File Model, file accessing models, file sharing semantics, file caching schemes, file replication, fault tolerance, atomic transactions, design principal, case studies.

UNIT-5 SYNCHRONIZATION AND REPLICATION

Introduction - Clocks, events and process states - Synchronizing physical clocks- Logical time and logical clocks - Global states - Coordination and Agreement - Introduction - Distributed mutual exclusion - Elections - Transactions and Concurrency Control- Transactions -Nested transactions -Locks - Optimistic concurrency control - Timestamp ordering - Atomic Commit protocols –Distributed deadlocks - Replication - Case study - Coda.

REFERENCE BOOKS

1. Modern operating system – Andrew S. Tanenbaum.
2. Distributed Operating Systems Concepts and Design – Pradeep K. Sinha.
3. Operating System – Achyuts Godbole.

SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TPE25	3	0	0	3 HOURS	40	60	3

MICROCONTROLLERS AND EMBEDDED SYSTEMS

UNIT -1

Microcontroller : types of microcontroller, architecture of microcontroller, family members & microcontroller resources,8051 microcontroller, internal & external memories, counters,timers synchronous serial cum asynchronous serial communication

Unit – 2

Microcontroller 8051 instruction sets: types of instruction sets interrupt control flow, interrupt handling structure, interrupt latency and interrupt dadlines, multiple sources of interrupts, non-maskable interrupt sources, interrupt structure in 8051, programmable timers in the mcu's, free running counter and real time control, interrupt interval and density contraints

Unit -3

Assembly and c programming: programming basics, structure of the cpu registers and and internal rams, programming in asembly language, assemblers, saving cpu status during interrupts, passing parameters, control structure, computing branch destinations at run time, programming in c and use of gnu tools, real time operating system , exemplary rtx51 rtos of keil, uses of rtos in design, development phases of a microcontroller-based system design

Unit-4

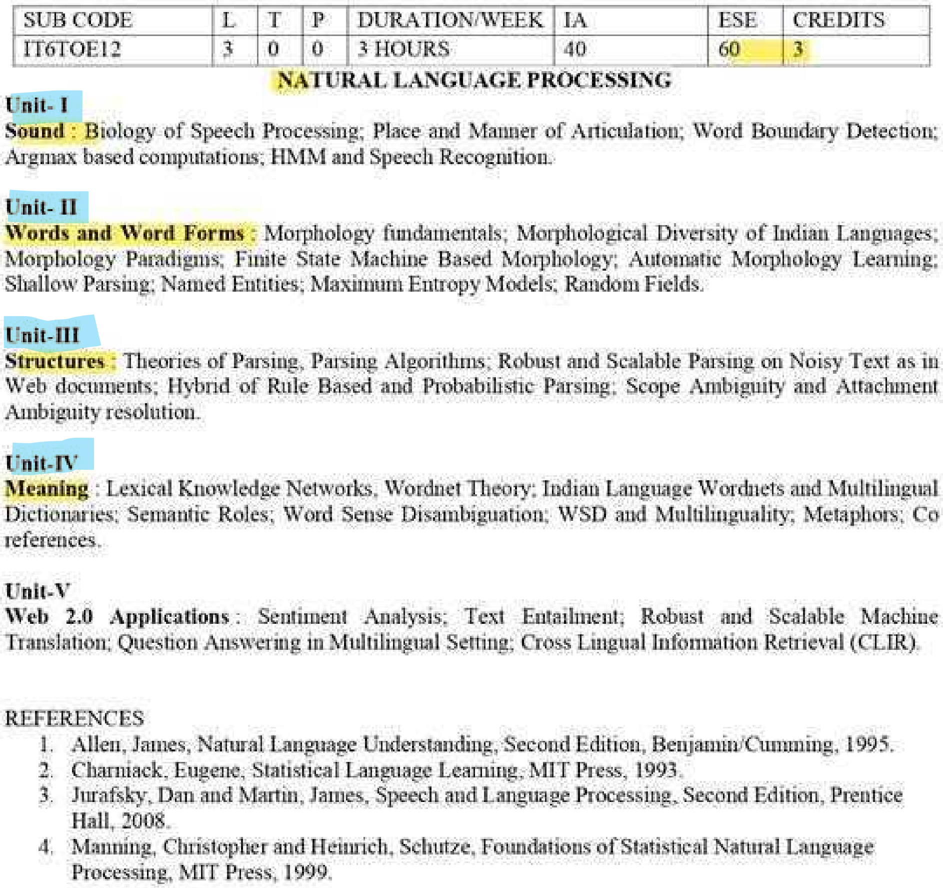
16 bit microcontrollers : 8096 /80196 family :- hardware. Memory map, io prots, programmable timers, interrupts, instructions. Motorola mc68hc11 family :- architecture, addressing modes and instructions, interfacing methods, interrupts, programmable timer. Arm 32 bit mcus : introcution of 16/32 bit processors, arm architecture and organization, arm/thumb programming model, instruction sets and development tools.

Unit -5

Inroduction of embedded systems :- an embedded system, hardware units in the system, software embedded in to a system, embedded system on chip (soc) and vlsi circuits, processor selection, memory selection for an embbeded system, allocation of memory to programe segments and blocks, memory map of a system, i/o devices, timer and counting devices, serial communication

REFERENCES

1. Architecture programming, interfacing and system design by raj kamal , pearson education.
2. Embedded systems design by rajeshwar singh , dhanpat rai publications.
3. Embedded systems by raj kalam , tata mcgraw hill publications



SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TOE12	3	0	0	3 HOURS	40	60	3

NATURAL LANGUAGE PROCESSING

Unit- I

Sound : Biology of Speech Processing; Place and Manner of Articulation; Word Boundary Detection; Argmax based computations; HMM and Speech Recognition.

Unit- II

Words and Word Forms : Morphology fundamentals; Morphological Diversity of Indian Languages; Morphology Paradigms; Finite State Machine Based Morphology; Automatic Morphology Learning; Shallow Parsing; Named Entities; Maximum Entropy Models; Random Fields.

Unit-III

Structures : Theories of Parsing, Parsing Algorithms; Robust and Scalable Parsing on Noisy Text as in Web documents; Hybrid of Rule Based and Probabilistic Parsing; Scope Ambiguity and Attachment Ambiguity resolution.

Unit-IV

Meaning : Lexical Knowledge Networks, Wordnet Theory; Indian Language Wordnets and Multilingual Dictionaries; Semantic Roles; Word Sense Disambiguation; WSD and Multilinguality; Metaphors; Co references.

Unit-V

Web 2.0 Applications : Sentiment Analysis; Text Entailment; Robust and Scalable Machine Translation; Question Answering in Multilingual Setting; Cross Lingual Information Retrieval (CLIR).

REFERENCES

1. Allen, James, Natural Language Understanding, Second Edition, Benjamin/Cumming, 1995.
2. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.
3. Jurafsky, Dan and Martin, James, Speech and Language Processing, Second Edition, Prentice Hall, 2008.
4. Manning, Christopher and Heinrich, Schutze, Foundations of Statistical Natural Language Processing, MIT Press, 1999.

SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TOE13	3	0	0	3 HOURS	40	60	3

PATTERN RECOGNITION

UNIT I PATTERN CLASSIFIER

Overview of Pattern recognition – Discriminant functions – Supervised learning – Parametric estimation – Maximum Likelihood Estimation – Bayesian parameter Estimation – Problems with Bayes approach– Pattern classification by distance functions – Minimum distance pattern classifier.

UNIT II CLUSTERING

Clustering for unsupervised learning and classification – Clustering concept – C Means algorithm – Hierarchical clustering – Graph theoretic approach to pattern Clustering – Validity of Clusters.

UINT III FEATURE EXTRACTION AND STRUCTURAL PATTERN RECOGNITION

KL Transforms – Feature selection through functional approximation – Binary selection -Elements of formal grammars - Syntactic description - Stochastic grammars - Structural representation. .

UNIT IV HIDDEN MARKOV MODELS AND SUPPORT VECTOR MACHINE

State Machines – Hidden Markov Models – Training – Classification – Support vector Machine – Feature Selection.42

UNIT V RECENT ADVANCES

Fuzzy logic – Fuzzy Pattern Classifiers – Pattern Classification using Genetic Algorithms – Case Study Using Fuzzy Pattern Classifiers and Perception.

REFERENCES:

1. M. Narasimha Murthy and V. Susheela Devi, "Pattern Recognition", Springer 2011.
2. S.Theodoridis and K.Koutroumbas, "Pattern Recognition", 4th Ed., Academic Press, 2009.
3. Robert J.Schalkoff, "Pattern Recognition Statistical, Structural and Neural Approaches", John Wiley & Sons Inc., New York, 1992.
4. C.M.Bishop, "Pattern Recognition and Machine Learning", Springer, 2006.
5. R.O.Duda, P.E.Hart and D.G.Stork, "Pattern Classification", John Wiley, 2001
6. Andrew Webb, "Stastical Pattern Recognition", Arnold publishers, London,1999.

SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TOE14	3	0	0	3 HOURS	40	60	0

WIRELESS & MOBILE COMMUNICATION

UNIT-I Introduction To Mobile & Wireless Devices:
Mobile and Wireless Devices, Simplified Reference Model; Wireless Transmission, Frequencies for Radio Transmission, Regulations, Technology ; Cellular Systems, Specialized MAC; SDMA; FDMA; TDMA; CDMA.

UNIT-II Telecommunication & Broadcast Systems Gsm:
Satellite Systems, Applications, GEO, LEO, MEO, Routing, Localization, Handover; Broadcast Systems, Cyclic Repetition of Data, Digital Audio Broadcasting.

UNIT-III Wireless Networks Wireless Lan:
IEEE 802.11, HIPERLAN, Wireless ATM, Services, Reference Model, Functions, Handover, Location Management, Addressing, QOS.

UNIT-IV Mobile Network And Transport Layers:
Mobile Network Layer; Mobile IP, Transport Layer, Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP; Fast Transmit/Fast Recovery, Transmission/Time Out Freezing, Selective Retransmission, Transaction Oriented TCP.

UNIT-V: Mobile Ad Hoc Networks (MANETs)
Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs. Protocols and Tools: Wireless Application Protocol-WAP. Bluetooth and J2ME.

Text Book

1. Mobile Communications – Schiller, Jochen; 2nd Indian Reprint, Pearson Education Asia-Addison Wesley Longman PTE. Ltd.

Reference Books:

1. Mobile Data Wireless LAN Technologies – Dayem, Rifaat A.; Prentice Hall International.
2. The Essential Guide To Wireless Communication Applications – Dornan, A.; 1st Indian Reprint, Pearson Education Asia.

SUB CODE	L	T	P	DURATION/WEEK	IA	ESE	CREDITS
IT6TOE15	3	0	0	3 HOURS	40	60	3

MACHINE LEARNING

Unit – I

Introduction: overview of machine learning, related areas, applications, software tools, course objectives Parametric regression: linear regression, polynomial regression, locally weighted regression, numerical optimization, gradient descent, kernel methods.

Unit – II

Generative learning: Gaussian parameter estimation, maximum likelihood estimation, MAP estimation, Bayesian estimation, bias and variance of estimators, missing and noisy features, nonparametric density estimation, Gaussian discriminant analysis, naive Bayes.

Discriminative learning: linear discrimination, logistic regression, logit and logistic functions, generalized linear models, softmax regression.

Unit – III

Neural networks: the perceptron algorithm, multilayer perceptron's, backpropagation, nonlinear regression, multiclass discrimination, training procedures, localized network structure, dimensionality reduction interpretation.

Support vector machines: functional and geometric margins, optimum margin classifier, constrained optimization, Lagrange multipliers, primal/dual problems, and KKT conditions, dual of the optimum margin classifier, soft margins, kernels, quadratic programming, and SMO algorithm.

Unit- IV

Graphical and sequential models: Bayesian networks, conditional independence, Markov random fields, inference in graphical models, belief propagation, Markov models, hidden Markov models, decoding states from observations, learning HMM parameters.

Unsupervised learning: K-means clustering, expectation maximization, Gaussian mixture density estimation, mixture of naive Bayes, model selection

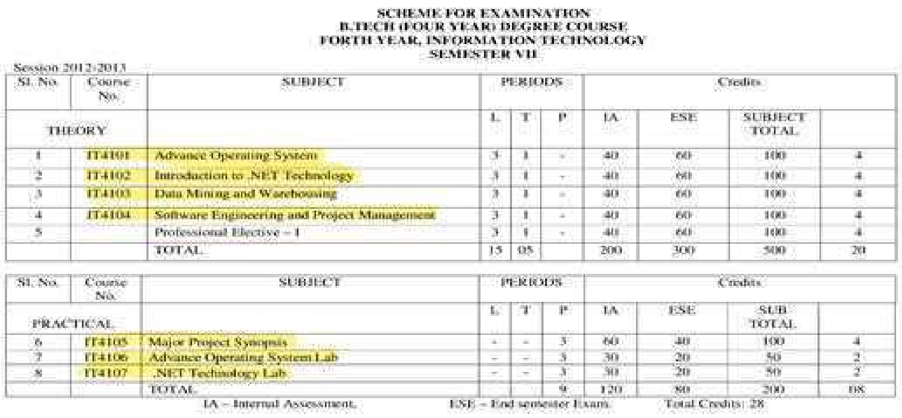
Unit – V

Q Learning , RL Learning , Advantages of ML , Application of ML

Reference Books :

1. Elements of Statistical Learning, T. Hastie, R. Tibshirani and J. Friedman, Springer, 2001.
2. Machine Learning, E. Alpaydin, MIT Press, 2010.
3. Pattern Recognition and Machine Learning, C. Bishop, Springer, 2006.
4. Machine Learning: A Probabilistic Perspective, K. Murphy, MIT Press, 2012.
5. Pattern Classification, R. Duda, E. Hart, and D. Stork, Wiley-Interscience, 2000.
6. Machine Learning, T. Mitchell, McGraw-Hill, 1997.

*********************End of VI Sem Scheme & Syllabus****************************



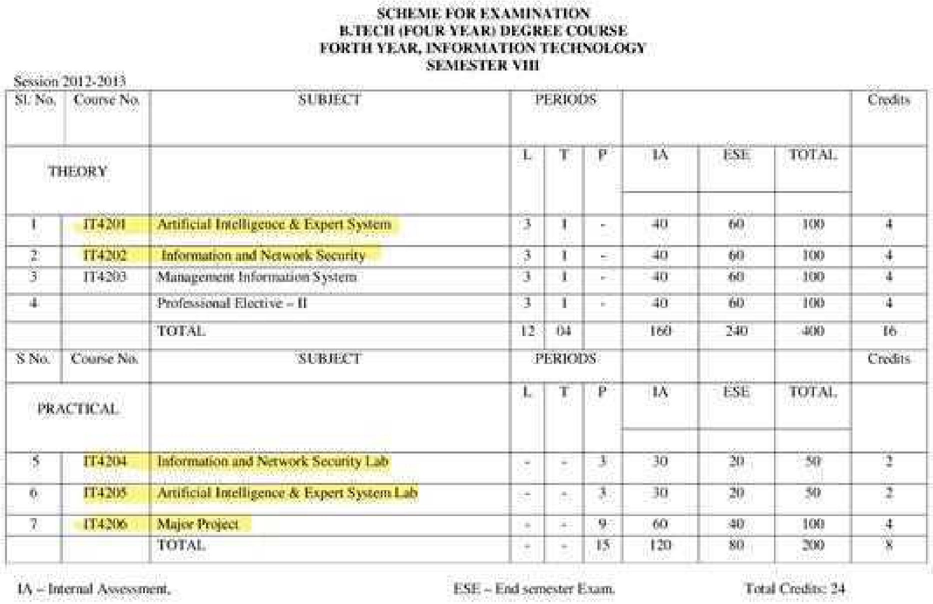
SCHEME FOR EXAMINATION
B.TECH (FOUR YEAR) DEGREE COURSE
FORTH YEAR, INFORMATION TECHNOLOGY
SEMESTER VII

Session 2012-2013

Sl. No.	Course No.	SUBJECT	PERIODS			Credits			
THEORY			L	T	P	IA	ESE	SUBJECT TOTAL	
1	IT4101	Advance Operating System	3	1	-	40	60	100	4
2	IT4102	Introduction to .NET Technology	3	1	-	40	60	100	4
3	IT4103	Data Mining and Warehousing	3	1	-	40	60	100	4
4	IT4104	Software Engineering and Project Management	3	1	-	40	60	100	4
5		Professional Elective – I	3	1	-	40	60	100	4
		TOTAL	15	05		200	300	500	20

Sl. No.	Course No.	SUBJECT	PERIODS			Credits			
PRACTICAL			L	T	P	IA	ESE	SUB TOTAL	
6	IT4105	Major Project Synopsis	-	-	3	60	40	100	4
7	IT4106	Advance Operating System Lab	-	-	3	30	20	50	2
8	IT4107	.NET Technology Lab	-	-	3	30	20	50	2
		TOTAL			9	120	80	200	08

IA – Internal Assessment. ESE – End semester Exam. Total Credits: 28

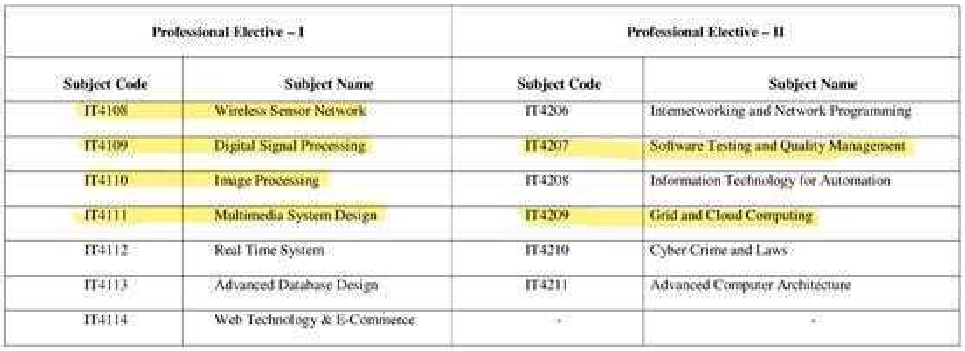


SCHEME FOR EXAMINATION
B.TECH (FOUR YEAR) DEGREE COURSE
FORTH YEAR, INFORMATION TECHNOLOGY
SEMESTER VIII

Session 2012-2013

Sl. No.	Course No.	SUBJECT	PERIODS						Credits
THEORY			L	T	P	IA	ESE	TOTAL	
1	IT4201	Artificial Intelligence & Expert System	3	1	-	40	60	100	4
2	IT4202	Information and Network Security	3	1	-	40	60	100	4
3	IT4203	Management Information System	3	1	-	40	60	100	4
4		Professional Elective – II	3	1	-	40	60	100	4
		TOTAL	12	04		160	240	400	16
S No.	Course No.	SUBJECT	PERIODS						Credits
PRACTICAL			L	T	P	IA	ESE	TOTAL	
5	IT4204	Information and Network Security Lab	-	-	3	30	20	50	2
6	IT4205	Artificial Intelligence & Expert System Lab	-	-	3	30	20	50	2
7	IT4206	Major Project	-	-	9	60	40	100	4
		TOTAL	-	-	15	120	80	200	8

IA – Internal Assessment. ESE – End semester Exam. Total Credits: 24



Professional Elective – I		Professional Elective – II	
Subject Code	**Subject Name**	**Subject Code**	**Subject Name**
IT4108	Wireless Sensor Network	IT4206	Internetworking and Network Programming
IT4109	Digital Signal Processing	IT4207	Software Testing and Quality Management
IT4110	Image Processing	IT4208	Information Technology for Automation
IT4111	Multimedia System Design	IT4209	Grid and Cloud Computing
IT4112	Real Time System	IT4210	Cyber Crime and Laws
IT4113	Advanced Database Design	IT4211	Advanced Computer Architecture
IT4114	Web Technology & E-Commerce	-	-

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4101	3	1	3	3 HOURS	40	60	4

ADVANCED OPERATING SYSTEM

UNIT I

GENERAL OVERVIEW OF THE SYSTEM: Introduction to Multi user System, History of UNIX, features & Benefits, Variants, UNIX Commands - who, pwd, cd, mkdir, rm, rmdir, ls, mv, ln, chmod, cp, grep, tr, etc. Vi Editor: Command & edit Mode, Invoking Vi, deleting & inserting Line, Deleting & Replacing Character, Searching for Strings, Introduction to sed. Bourne Shell, C Shell, Shell Variables, Scripts, Meta Characters, If & CASE Statements, For, While and Until loops. AWK Pattern Scanning and Processing, AWK Arithmetic and Variables, built in functions and Operators, Arrays, Strings.

UNIT II

DESIGN OF OPERATING SYSTEM: System Structure, User Perspective, Operating System Services Assumption about Hardware, the Kernel and Buffer Cache Architecture of UNIX Operating System, System Concepts, Buffer Headers, Structure of the Buffer Pool, Scenarios for Retrieval of the Buffer, Reading and Writing Disk Blocks, Advantages and Disadvantages of Buffer Cache.

UNIT III

INTERNAL REPRESENTATION OF FILES: Overview of File system, System Calls for the File System, INODES, Structure of Regular File, Directories, Conversions of a Path, name to an INODE, Super Block, INODE Assignment to a New File, Allocation of Disk Blocks. Open, Read, Write, File and Record Close, File Creation.

UNIT IV

STRUCTURES OF PROCESSES AND PROCESS CONTROL: Process States and Transitions Layout of System Memory, The Context of a Process, Manipulation of the Process Address Space, Sleep Process Creation/Termination, The User ID of a Process, Changing the Size of a Process.

UNIT V

DISTRIBUTED OPERATING SYSTEM: Design of distributed OS, Resource sharing, Distributed OS architectures, software layers, Architectural Model, The Operating System Layer, Protection, Processes and Threads, Communication and invocation, Distributed File System: File Service Architecture, Sun Network File System, the Andrew File System, and Recent Advances.

List of Books:

1. The Design of Unix Operating System,Maurice J. Bach, Pearson Education
2. Advance UNIX, a Programmer's Guide, S. Prata, BPB Publications, New Delhi.
3. Shell Programming, Yashvant Kanitkar, BPB Publications, New Delhi.
4. UNIX Concepts and Applications, Sumitabh Das.
5. Distributed OS, A.S Tanenbaum, PHI.

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4102	3	1	3	3 HOURS	40	60	4

INTRODUCTION TO .NET TECHNOLOGY

UNIT I

Introduction to .NET framework, Managed Code and the CLR- Intermediate Language, Metadata and JIT Compilation, Automatic Memory Management, CLR, The Framework Class Library, IDE of .Net, Introduction to C# Language

UNIT II

.Net Elements, Variables and constants, Data types, Operators , Loops and Program flow, Decision statements Type, Arrays with various types , Collections , Windows Forms , Windows controls – Button, Check box, Combo box, Label, List box, Radio Button, Text box, Various Events , Creating menus – menu items – context menu - Common dialog boxes & MDI

UNIT III

Architecture of ADO.NET – ADO.NET providers – Connection – Command – Data Adapter – Dataset. Connecting to Data Source, Accessing Data with Data set and Data Reader - Create an ADO.NET application - Using Stored Procedures.

UNIT IV

ASP.NET Features, IIS Configuration, ASP.Net Web Controls - HTML Controls, Using Intrinsic Controls, Using Input Validation Controls, Selecting Controls for Applications - Adding Web controls to a Page.

UNIT V

XML Serialization in the .NET Framework, Introduction to Web services and AJAX, Crystal Reports.

List of Books:

1. Introduction to Visual basic.NET - NIIT Prentice Hall of India,2005
2. Introducing Microsoft .NET- David S. Platt Microsoft Press", Saarc Edition, 2001
3. Introduction to Microsoft® ASP.NET Work Book - Microsoft- Microsoft Press
4. Developing XML Web Services Using Microsoft® ASP.NET -Microsoft- Microsoft Press
5. Designing Microsoft ASP.NET Applications-Douglas J. Reilly-Microsoft Press
6. ASP.NET-Danny Ryan and Tommy Ryan-Hungry Minds Maran Graphics

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4103	3	1	0	3 HOURS	40	60	4

DATA MINING & WAREHOUSING

UNIT I

Data ware Housing: What is a data warehouse?, definition, Multidimensional data model, OLAP operation, warehouse schema, data ware housing architecture, warehouse serve, metadata, OLAP, engine, Data warehousing backend process, other features.

Data Mining: what is data mining? KDD Vs. data mining, DBMS Vs DM other related areas, DM techniques, other mining problem, issues & challenges in DM, Dm application areas.

UNIT II

Association rules: Methods to discover association rules, apriori algorithm ,partition algorithm, pincer – search algorithm, Dynamic Item set counting algorithm, FP-tree Growth algorithm, Incremental algorithm, Border algorithm, hierarchical association rule, generalized association rules, Association rules with item constraints.

UNIT III

Clustering Techniques: Introduction, clustering paradigms, partitioning algorithms, k-Medoid Algorithm, CLARA, CLARANS, Hierarchical clustering, DBSCAN, BIRCH, CURE, Categorical clustering algorithms , STIRR, ROCK , CACTUS.

UNIT IV

Decision trees: Tree construction principal, Best spilt splitting indices, splitting criteria, Decision tree construction algorithm, CART, ID3, C4.5, CHAID, Decision tree construction with pre-sorting, rainforest, approximate method, CLOUDS, BOAT, pruning technique, integration of pruning & construction, Hierarchcal associtation rule.

UNIT V

Web Mining: Web mining ,web content mining ,web structure mining ,web usage mining ,text mining , unstructured text , Episode rule discovery for texts , Hierarchy of categories , text clustering , Paging algorithm.

List of Books:

1. Data Mining techniques – Arun K Pujari Universities press
2. Data Mining concepts & techniques – Jiawei han , Micheline kamber Morgan Kaufmann publisher Elsevier India –2001
3. Data Mining methods for knowledge Discovery –Cios , Pedrycz , swiniarski Kluwer academic publishers London –1998

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4104	3	1	0	3 HOURS	40	60	4

SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

UNIT I

Software Engineering – What is software, Characteristics of software, Application of software, Software Process Models - Linear Sequential model, Prototype model, RAD model, Incremental model, Component Based Development Model, Fourth Generation Techniques.

UNIT II

MANAGING SOFTWARE PROJECT: The Management Spectrum-People, Product, Process, Software Process and Project Metrics - Measures, Metrics and Indicators, Process and Project Metrics, Software Measurement-Size Oriented Metrics, Function Oriented Metrics, Metrics For Quality-Overview, Measuring Quality, DRE. Software Requirement Specification-Problem Analysis, Requirement Specification, Validation, metrics, monitoring and control. Models, The Make /Buy Decision. Software Project Management - Cost estimation, project scheduling, Staffing, Software configuration management, Quality assurance, Project Monitoring, Risk management etc.

UNIT III

System Design - Problem portioning, abstraction, top-down and bottom-up design, Structured approach, Functional versus Object oriented approach, design specification and verification, metrics, monitoring and control.

UNIT IV

Coding: Top–down and bottom-up structured programming, information hiding, programming style, internal documentation, verification. Metrics, monitoring and control

UNIT V

Software testing – software Testing fundamentals, white box testing, Basics path testing, A strategic Issues, Unit testing, Integration testing, validation testing, System Testing software metrics, software evaluation, software maintenance & reliability.

List of Books:

1. Software Engg, Pressmen
2. Software Engg, Pankaj Jalote
3. Software Engg, Shaum's Outline Series
4. Fundamentals of Software Engineering, Rajib Mal.

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4108	3	1	-	3 HOURS	40	60	4

WIRELESS SENSOR NETWORK

UNIT I

Wireless Sensor Network: Introduction, Architecture, Hardware and Software used in Wireless Sensor Network

UNIT II

Sensor network application: Motion monitoring, Environmental monitoring, Generic Architecture, Sensor network Evolution

UNIT III

Wireless Sensor Network : Design , Goals and Issues , Sensor deployment, Scheduling and coverage issues, self configuration and topology control, Querying, data collection and processing, Collaborative information processing and group connectivity.

UNIT IV

Wireless Sensor Routing Protocols: Data Centric, Hierarchical, Location based, Energy efficient routing,

UNIT V

Sensor Network Challenges – Miniaturization, power management, scalability, remote management, usability, standardization and security, System Challenges- Tiny OS, Network Sensor Platforms

List of Books:

1. Building Wireless Sensor Networks by Robert Faludi Binding: Paperback Publisher: O'reilly Released: 2011
2. Wireless Sensor Networksby Zhao Feng, Guibas Leonidas Binding: Paperback Publisher: Elsevier India Released: 2004
3. Wireless Sensor Networks by C. S Raghavendra, Krishna M. Sivalingam, Taieb Znati Binding: Paperback Publisher: Springer/bsp Books Released: Rpt.2010

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4109	3	1	0	3 HOURS	40	60	4

DIGITAL SIGNAL PROCESSING

UNIT I

Classification of Signals and systems, Classification of signals, Singularity Functions, Amplitude and Phase Spectra, Classification of System, Simple Manipulations of Discrete-time Signals, Representation of Systems, Analog-to-Digital Conversion of Signals. Z-Transforms -Introduction, Definition of the z-transform, Properties of z-transform, Evaluation of the Inverse z-transform.

UNIT II

Linear time invariant systems, Properties of a DSP System, Difference Equation and its Relationship with System Function, Impulse Response and Frequency Response, Frequency Response.

UNIT III

Discrete and fast Fourier transforms. Introduction, Discrete Convolution, Discrete-Time Fourier Transform (DTFT), Fast Fourier Transform (FFT). Computing of Inverse DFT by Direct DFT, Composite-radix FFT, Fast (sectioned) Convolution, Correlation.

UNIT IV

Finite impulse response (fir) filters Introduction, magnitude response and phase response of digital filters. Frequency response of Linear phase FIR filters, design techniques for FIR filters, design of optimal linear phase FIR filters.

Infinite impulse response (iir) filters Introduction, IIR filter designed by approximation of derivatives, IIR filter design by impulse invariant method, IIR filter design by the bilinear transformation, butter worth filters Chebyshev filters, Inverse Chebyshev filters, Elliptic filters, Frequency Transformation.

UNIT V

Realisation of digital linear systems Introduction, basic realisation block diagram, signal-flow graph, basic structures for IIR systems, basic structures for FIR systems applications of digital signal processing :

Introduction, voice processing, application of radar, applications to image processing, Introduction to Wavelets.

List of Books:

1. Digital signal processing- S. Salivahanan, A. Vallavraj, C. Gnanapriya;TMH
2. Discrete time signal processing- A.V. Oppenheim, Schaffer.

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4110	3	1	0	3 HOURS	40	60	4

IMAGE PROCESSING

UNIT I

INTRODUCTION: digital image representation, electromagnetic spectrum, fundamental step in digital image processing, elements of visual perception structure of human eye, sampling and quantization, basic relationship between pixels, imaging geometry

UNIT II

STATISTICAL PROPERTIES: Histogram means, standard deviation, profile different distributions. IMAGE TRANSFORM: One and two dimensional DFT the discrete cosine transform, hadamand transform, haar transform

UNIT III

IMAGE ENHANCEMENT: Spatial and frequency domain methods points operations, contrast stretching, bit extraction, range compression, histogram equalization, modification local enhancement, image smoothing spatial operations

UNIT IV

IMAGE RESTORATION: degradation model, Restoration in spatial domain geometric transformation spatial transformation, approach to restoration, image compression: basic of image compression, models, elements of information theory, error free compression, lossy compression,

IMAGE SEGMENTATION: line detection, edge detection, thresholding & region oriented segmentation.

UNIT V

APPLICATION OF IMAGE PROCESSING: Charector recognisation, diagram understanding, medical imaging, scientific analysis, military guidance & reconnaissance remote sensing, telecommunication, example of field that uses digital image processing

List of Books:

1. Gonzawlez & woods, digital image prcessing addison wesley, 1992.
2. Pratt, digital image image processing wiley int. 1991.
3. Sid ahmed digital image prcessing McGraw Hill, 1995.

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4111	3	1	0	3 HOURS	40	60	4

MULTIMEDIA SYSTEM DESIGN

UNIT I:

An introduction, Multimedia elements, Multimedia Applications, Multimedia System Architecture, Evolving Technologies for Multimedia Systems, Defining Objects for Multimedia systems, Multimedia Data Interface Standard, The need for data Compression, Multimedia databases.

UNIT II:

Compression and Decompression, Types of compression, Binary Image Compression schemes, Color, Gray Scale, Still-video image Compression, Video Image Compression, Audio Compression, Fractal Compression.

UNIT III:

Data and Format Standards, Rich-text Format, TIFF File Format, Resource Interchange File Format (RIFF), MIDI File Format, JPEG DIB File Format for still and Motion Images, MPEG standards Pen Input, Video and Image Display systems, Print Output Technologies, Image Scanners, Digital Voice and Audio, Digital Camera, Video Images and Animation, Full-Motion Video.

UNIT IV:

Storage and Retrieval Technologies, Magnetic Media Technology, Optical Media, Hierarchical Storage Management, Cache management for storage systems, Multimedia Application Design, Multimedia application classes, Types of multimedia systems, Components of multimedia systems, Organizing multimedia databases,

UNIT V:

Unified Communication, video conferencing and Chat, Multimedia Authoring and User Interface, Multimedia authoring system, Hypermedia application design consideration, User interface design, Object display/playback issues, Multimedia Operating Systems Introduction, real time, Resource management, process management, file systems.

List of Books:

1. Prabhat K.Andleigh & Kiran Thakrar, multimedia system design, Prentice PTR, NJ.
2. Ralf Steinmetz and Klara Nahrstedt multimedia computing communications and applications, innovating technology series by Pearson Edu. Asia.
3. Jerry D.Gibson, multimedia communications directions & innovations, Harcourt India Pvt.Ltd.
4. Borko, Handbook of multimedia computing,CRC Press.
5. Mark J.Bunzel Sandra K.Morris, multimedia applications development McGraw Hill.
6. Ze-Nian Li, Mark S.Drew, fundamentals of multimedia, by Pearson Edu. Asia

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4201	3	1	3	3 HOURS	40	60	4

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS

UNIT I

Introduction: AI definition, structure, Application; Production systems-state space search, control strategies, Application; Search methods: Heuristic search, forward and backward reasoning, Hill climbing techniques, Breadth first search, Depth first search, Best search, Game playing.

UNIT II

Formal Methods: Predicate logic, Resolution question-answering, alpha-beta pruning, mini-max search, statistical and probabilistic reasoning; Informal Methods : Rule based system, frames and scripts, Semantic Nets, conceptual dependency, conceptual graphs.

Unit III

Reasoning: Automated reasoning, Monotonic & Nonmonotonic Reasoning, Default Logic , Probabilistic reasoning ,Bayesian Network, confidence factor, System Interface.

AI languages: Important characteristics of AI languages - PROLOG, LISP.

Unit IV

Introduction to Expert Systems: Structure of an Expert system, Interaction with an expert, Expert system shell, Design of an Expert system, Hardware & software components of Expert system, Application of Expert system in various fields.

Unit V

Neural Network: Basic Structure of a neuron, Perception, Feed forward, Feed back network, Recurrent network; Associative Network: Hopfield, Radial Basis function network, Self organising network.

List of Books:

1. Rich E and Knight K - Artificial Intelligence, TMH New Delhi.
2. Patterson -Artificial Intelligence & Expert System Prentice Hall of India.
3. Artificial Intelligence - R.B. Mishra ,Prentice Hall of India.

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4202	3	1	3	3 HOURS	40	60	4

INFORMATION AND NETWORK SECURITY

UNIT I

A Model for Network Security Services, Mechanisms, and Attacks, Viruses & Worms, The OSI Security Architecture, symmetric cipher model, substitution techniques Transposition techniques, Steganography.

UNIT II

Block ciphers and the data encryption standard , simplified DES , Block cipher principles , The data Encryption Standard , Differential and Linear Cryptanalysis ,Block Cipher Design principles , The AES cipher , Triple DES , blowfish , RC5, Rc4 Stream Cipher

UNIT III

principles of public –Key Cryptosystems , public –Key cryptosystems , Requirements for public –Key Cryptosystems, The RSA Algorithm , Key management , key Distribution ,Hash Functions SHA, MD5, Diffie-Hellman Key Exchange Algorithm

UNIT IV

WEB & IP Security: Web Security Threats, SSL Architecture, SSL Record Protocol, Alert Protocol , Handshake Protocol , Transport Layer Security , Secure Electronic Transaction , IP Security

UNIT V

Intruders : Intrusion Techniques ,Intrusion Detection , Audit Records , Firewall Design principles , Firewall Characteristics , Types of Firewalls .

List of Books:

1. Cryptography and Network Security, Principles and Practice Third edition , William Stallings .
2. Atul Kahate, " Cryptography and Network Security," TMH
3. Introduction to network security, Krawetz, Cengage

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4207	3	1	0	3 HOURS	40	60	4

SOFTWARE TESTING AND QUALITY MANAGEMENT

UNIT I

Software Quality: Ethical Basis for software Quality , Total quality Management Principles, Software Processes and Methodologies , Quality Standards , Practices & conventions, Top Down and Bottom Up Approach.

UNIT II

Software management Reviews and Audits, Enterprise Resource Planning Software, Measurement Theory , Software Quality Metrics, designing Software Measurement Programs , Organizational Learning.

UNIT III

Improving Quality with methodologies: Structured information Engineering , Object-Oriented Software , Reverse Engineering , Measuring Customer Satisfaction Defect Prevention , Reliability Models , Reliability Growth Models .

UNIT IV

Software Quality Engineering: Defining Quality Requirements Management, Complexity Metrics and Models, Management issues for software Quality, Project Tracking and Oversight, Use of CASE tool Technology, Role of Groupware, data Quality Control.

UNIT V

Project Configuration management: Configuration Management Concepts, Configuration Management Process, Document Control, Configuration Management plan of the WAR Project.

List of Books:

1. Stephan Kan, Metrics and Models in Software quality, Addison Wesley.
2. Mark Paulik, The capability Maturity Model-guidelines for improving the software Process, Addison Wesley.
3. Michael, Deutsch, Willis, Ronald r-Software Quality Engineering- A Total Technical and Management approach, Prentice Hall.
4. Ginac, Frank P, Customer Oriented Software Quality Insurance, Prentice Hall.
5. Wilson, Rodney C, Software RX secrets of Engineering Quality Software, Prentice Hall.
6. Pressman, Software Engineering-A practitioner's approach
7. Pankaj Jalote, CMM Project

SUB CODE	L	T	P	DURATION	IA	ESE	CREDITS
IT4209	3	1	0	3 HOURS	40	60	4

GRID AND CLOUD COMPUTING

UNIT I

Cloud Computing, History of Cloud Computing, Cloud Architecture, Cloud Storage, Why Cloud Computing Matters, Advantages of Cloud Computing, Disadvantages of Cloud Computing, Companies in the Cloud Today, Cloud Services.

UNIT II

Web-Based Application, Pros and Cons of Cloud Service Development, Types of Cloud Service Development Infrastructure as a Service, Introduction, Resource Virtualization Server, Storage, Network

UNIT III

On-Demand Computing, Discovering Cloud Services, Development Services and Tools, Amazon Ec2, Google App Engine, IBM Clouds Centralizing Email Communications, Cloud Computing for the Community , Collaborating on Group Projects and Events, Cloud Computing for the Corporation.

UNIT IV

Grid Computing: History, Definition, Types, Architecture and Goals

UNIT V

Applications and Challenges of Grid Computing, Providers of Grid Computing

List of Books:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing.
3. Viktors Berstis , Grid Computing : IBM Red Book