



NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR
DEPARTMENT OF INFORMATION TECHNOLOGY

SEMESTER: V

S.No.	Board of Studies	Sub.Code	Subject Name	Periods/week			Examination Scheme					Total Marks	Credits L+(T+P)/2
				L	T	P	TA	FE	SE	T.C.A.	ESE		
1	Information Technology	IT 501	Computer Networks	3	1	-	20	15	15	50	70	120	4
2	Information Technology	IT 502	Design Analysis of Algorithms	4	1	-	20	15	15	50	70	120	5
3	Information Technology	IT 503	Microprocessors	3	1	-	20	15	15	50	70	120	4
4	Information Technology	IT 504	Database Management System	3	1	-	20	15	15	50	70	120	4
5	Information Technology	IT 505	Computer Graphics	3	1	-	20	15	15	50	70	120	4
6	Information Technology	IT 50X	Elective I	3	1	-	20	15	15	50	70	120	4
7	Information Technology	IT 591	Computer Graphics Lab	-	-	3	30	-	-	30	20	50	2
8	Information Technology	IT 592	Database Management System Lab	-	-	3	30	-	-	30	20	50	2
9	Information Technology	IT 593	Computer Networks Lab	-	-	3	30	-	-	30	20	50	2
10	Humanities		Managerial Skill	-	-	2	25	-	-	25	0	25	1
11			Technical Visit/ Practical Training	-	-	-	25	-	-	25	0	25	1
			Total	19	6	11	260	90	90	440	480	920	33

Elective I		
Sr.No.	Sub.Code	Subject Name
1	IT 506	Operation Research
2	IT 507	Human Computer Interaction
3	IT 508	Bioinformatics
4	IT 509	Industrial Psychology
5	IT 510	E - Commerce

Note : For attendance of a student in every theory and practical class, the teachers are supposed to keep records. Itimately in the following format which will be included in the semester mark-sheets.

T.C.A. = Total of Continuous Assessment.

Format for attendance				
Attendance				Category
> 85			----- >	High "H"
> 70 & < 85			----- >	Medium "M"
> 60 & < 70			----- >	Low "L"
< 60			----- >	Poor "P"

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
Department of Information Technology
SEMESTER – V

“Computer Networks”

Theory Periods: 30

Credits: 4

Tutorials: “10”

Code: IT 501

UNIT I

Course logistics, Introduction to Networks, OSI layers, Inter-layer communication, PHY layer, NRZ, NRZI, Manchester, 4B/5B, framing, error detection, FEC vs ARQ, Stop-and-Wait, inefficiency of stop-and-wait, bit-pipe model, bandwidth-delay-product. Sliding window protocol, Network topologies (bus, ring, star).

UNIT II

Modes of transmission (unicast, broadcast, multicast, anycast), ALOHA, ALOHA analysis, efficiency/throughput, slotted ALOHA. Ethernet PHY properties, cables, CSMA/CD, Ethernet min. frame length requirement, jamming, wireless and lack of collision detection. Wireless CSMA/CA, hidden nodes, RTS/CTS, token ring, Token ring algorithm, Ethernet vs token ring, , Comparison of switching mechanisms, circuit switching, packet switching, virtual circuit switching, source routing, Ethernet bridging, learning bridges, looping issue, Ethernet spanning tree protocol

UNIT III

Distance vector routing algorithm, Counting to infinity problem, Link state routing algorithm, IP addressing, hierarchical routing, what is Internetworking, IP forwarding algo, ARP, DHCP, IP packet format, IP fragmentation and reassembly, Subnetting, CIDR/Supernetting, ICMP, ISPs, Autonomous Systems, ISP relationships, Types of AS, BGP: path vector protocol

UNIT IV

Transport layer functionalities, application expectations and IP delivery semantics, UDP functionality, UDP header; why is reliability at the transport layer different from reliability at the link layer?, TCP features, byte-stream, connection-oriented, TCP header format, 4-tuple, incarnations of a TCP connection, 3-way handshake, initial sequence numbers, TCP state diagram, TCP sliding window, , RTT estimation, Jacobson/Karel's algorithm for RTT estimation, slow-start, congestion avoidance, self-clocking/ack-clocking, TCP Tahoe, Fast retransmit, fast recovery, Resource allocation models, evaluation metrics, queuing models, quality of service.

UNIT V

Real-time applications; classification of applications, Introduction to cryptography and network security, Domain Name System (DNS), Applications: SMTP, RFC622, MIME, Email clients, servers, SMTP gateways, HTTP, persistent TCP connections

Name of Text Books:

1. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 2003.
2. Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.

Name of Reference Books:

1. Larry L. Peterson and Peter S. Davie, "Computer Networks", Harcourt Asia Pvt. Ltd., Second Edition.
2. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000..

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
Department of Information Technology
SEMESTER – V

“Design Analysis of Algorithm”

Theory Periods: 40
Credits: 5

Tutorials: “10”
Code: IT 502

Unit –I

Analyzing algorithms, Algorithm types, Recurrence Equations, Growth function: Asymptotic notation, Standard notation & common functions, Recurrence relation, different methods of solution of recurrence equations with examples.

Unit –II

Introduction to Divide and Conquer paradigm, Quick and merge sorting techniques, Linear time selection algorithm, the basic divide and conquer algorithm for matrix multiplication Strassen Multiplication and, Red Black tree, Binary Search tree , heap sort, shell & bucket sort.

Unit –III

Overview of the greedy paradigm examples of exact optimization solution (minimum cost spanning tree), Knapsack problem, Single source shortest paths.Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, Matrix multiplication, Traveling salesman Problem, longest Common sequence.

Unit –IV

Representational issues in graphs, Depth first search & Breath first search on graphs, Computation of biconnected components and strongly connected components using DFS, Topological sorting of nodes of an acyclic graph & applications, Shortest Path Algorithms , Bellman-Ford algorithm, Dijkstra’s algorithm & Analysis of Dijkstra’s algorithm using heaps, Floyd-Warshall’s all pairs shortest path algorithm

Unit –V

The general string problem as a finite automata, Knuth Morris and Pratt algorithms, Linear time analysis of the KMP algorithm, The Boyer-Moore algorithm. Backtracking & Recursive backtracking, Applications of backtracking paradigm ,Complexity measures, Polynomial Vs Nonpolynomial time complexity; NP- hard and NP-complete classes, examples.

Name of Text Books:

1. Coreman, Rivest, Lisserson, : “Algorithm”, PHI.
2. Basse, "Computer Algorithms: Introduction to Design & Analysis", Addison Wesley.
3. Horowitz & Sahani, "Fundamental of Computer Algorithm", Galgotia.

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
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SEMESTER – V

“Microprocessors”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 503

UNIT I

Review of logic design using MSI/LSI chips such as De-multiplexers/Decoders, Multiplexers, Priority encoders, Registers, Counters, Buffers, Latches. Introduction to functions performed by microprocessor, R/W and ROM memory models, Memory map and addresses, I/O devices, I/O Addressing. The 8085 programming model, Instruction classification, Instruction and data formats, Addressing modes, Data transfer operations, Arithmetic operations, Logic operations, Branch operations, Writing Assembly Language programs, Hand assembly of a program 8085 Microprocessor architecture, Logic pin-out, machine cycles and bus timings

UNIT II

Memory interfacing, Absolute, Partial decoding, Multiple Address range, Interfacing memory with wait states, Interfacing I/O devices, Peripheral I/O, Memory mapped I/O, 8085 single-board microcomputer system. Interfacing of 8085 with 8155/8156 (RAM), 8355/8755 (ROM). Programming techniques with additional instructions, Looping, counting and indexing, Data transfer from/to memory to/from microprocessor, 16-bit arithmetic instructions, Logic operations like rotate, compare, Time delays, Counters, Stack, Subroutine, Call and return instructions. Interrupts, The 8085 interrupt process, multiple interrupt and priorities, vectored interrupts, Restart as software instruction.

UNIT III

Programmable Interfacing devices, Basic concept, 8279 programmable Keyboard/Display interface, 8255A programmable Parallel interface, Interfacing keyboard and display using 8255A, 8254 programmable Interval Timer, 8259A programmable Interrupt Controller, Direct Memory Access (DMA), 8237 DMA Controller. Serial I/O and Data communication, Basic concept in serial I/O, Data communication over telephone lines, Standards in serial I/Os, The 8085-serial I/O lines, 8251A programmable communication interface Microprocessor Applications, Interfacing scanned multiplexed displays and Liquid Crystal Displays, Interfacing a matrix keyboard.

UNIT IV

Architecture and pin configuration of 8086, Instruction Format; Addressing modes Basic 8086 system bus architecture, Minimum mode Configuration, Maximum mode configuration; memory interfacing with 8086 in minimum and maximum mode; System Bus Timings, Bus Standards. Interrupts of microprocessor 8086

UNIT V

Instruction set of 8086 and programming examples, Data Transfer Instruction; Arithmetic Instructions; Branching and Looping Instructions, NOP and Halt, Flag Manipulation Instructions; Logical, Shift and Rotate Instruction. Byte and String Manipulation: String Instructions; REP Prefix, Table Translation, Number Format conversions. Assembler Directives and Operators; Assembly Process; Translation of assembler Instructions. Programming of microprocessor 8086

Name of Text Books:

1. Microprocessor Architecture, Programming and Application by R. S. Gaonkar, Wiley Eastern.
2. Advance Microprocessor and Peripherals (Architecture, Programming & Interfacing) by A. K. Roy & K. M. Bhurchandi – TMH

Name of Reference Books:

1. The Intel Microprocessor – (Architecture, Programming & Interfacing) by Barry B. Bery.
2. Microprocessors and Programmed Logic (2nd Edition), Pearson Education by Kenneth L. Short
3. Microcomputer Systems: The 8086/8088 Family, Yu-Cheng Lieu & Glenn A. Gibson, Prentice Hall India.
4. Microprocessors & Interfacing: Programming & Hardware, Douglas V. Hall, Tata McGraw Hill.

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
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SEMESTER – V
“Database Management System”

Theory Periods: 40
Credits: 4

Tutorials: “10”
Code: IT 504

UNIT-I: Introduction to Database

Advantages of DBMS, Type of Data Models, Classification of DBMS, Schema and instances, DBMS Architecture and Data Independence, Entity- Relationship Model, Attributes and Keys, Relationship Types, Types of Entity, Enhanced E-R Modeling, Specialization and Generalization, Construction & Conversion of E-R Diagram into Tables, Constraints of E-R Diagram, Merits & Demerits of E-R Diagram.

UNIT-II: Database Design

Logical Database design: various Database Design Strategies, Functional Dependencies, Types and Characteristics of FD, inference Rule, closure set of attributes & applications (equivalences & canonical form), Normalization for Relational Databases: Definition, Types of Normalization: First Normal form, Second Normal form, Third Normal form, Boyce-codd normal form, problem related with normal forms & solutions. Multivalued & Join Dependencies, 4th & 5th Normalization, Numerical based on Normal forms, Merits & Demerits of Normalization.

UNIT-III: Structured Query Language

Components of SQL: DDL, DML, DCL, View, Index, Cursors and Triggers, Query Processing: Query processing stages, Query interpretation, Query execution plan, Table scans, Classification Queries, Aggregate function, Use of Group By, Having, Order by Clause, sub queries characteristic & classification, Use of Any, All, Exist & Not Exist operator, join operator, types of join, Structure of a query optimizer.

UNIT-IV: Relational Algebra, Relational Calculus & Transaction Processing

Classification of Relational Algebra operator (Native, Extended and Set Operators), Relational data model concepts, constraints, Relational Calculus: Tuple Relational Calculus & Domain Relational Calculus.

Transaction Processing: Types of failures, ACID property, Six different isolation problems, schedules and recoverability, serialisability of schedules, Levels of transaction consistency, Deadlocks, Nested transaction, Transaction benchmarking.

UNIT –V: Indexes, Concurrency Control & Crash Recovery

File Organizations: Introduction, Secondary Storage Devices, Buffering of Blocks, Structure of Files: Types of Single Level ordered indexes, Multilevel indexes, Dynamics Multilevel indexes using B-trees and B+- Trees.

Concurrency Control: Different type of concurrency control techniques & their comparative analysis, Locking techniques, Time-stamp ordering, Multi-version techniques, Optimistic techniques, Multiple granularity. Integrity, Security, Non-procedural and procedural integrity constraints, Integrity constraints specifications in SQL. Failure classification, Different type of Recovery techniques & their comparative analysis, deferred update, immediate update, Shadow paging, Check points, On-line backup during database updates,

Name of Text Books:

1. Database system concept, Korth & Sudarshan, MH.
2. Introduction to Database Systems, C.J.Date, Pearson Education.

Name of Reference Books:

1. Principles of Database Systems", 2nd Edn., Ullman, J.O, Galgotia Publications.
2. Fundamentals of Database Systems, Elmasri & Navathe, Pearson Education.
3. Database Design Fundamentals, Rische, PHI.

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
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SEMESTER – V

“Computer Graphics”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 505

UNIT- I: OVERVIEW OF GRAPHICS SYSTEM

I/O devices, Raster scan & Random scan system, line and circle generation methods, Filled area primitive, solid area filling algorithms.

UNIT- II: Transformations & Projection

2-D Transformation , basic geometric transformations, Transformation in homogeneous coordinate system, 3-D transformations, Projection: parallel projection, perspective projection, Vanishing points. Line Clipping algorithms; Cohen-Sutherland algorithm, Midpoint subdivision algorithm, Cyrus beck algorithm, Polygon Clipping.

Unit – III: Curve Design

Parametric curves, Need for cubic parametric curves c_0 , c_1 , c_2 continuity, Bezier curves , Generation through ernstein polynomials, Condition for smooth joining of 2 segments, Convex Hull property, B-Spline Curves: Properties of B-spline curves, Finding Knot vectors-uniform and open uniform , Non-uniform, rational B-splines, Beta splines, Subdividing curves, Drawing curves using forward differences.

UNIT- IV: HIDDEN SURFACE REMOVAL & FRACTALS

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.

Fractals: self-similar fractals-fractal dimension, Generation of Terrain-random mid point displacement, Grammar based models, Self-squaring fractals.

Soild Modelling: Generation through sweep techniques, Constructive sold geometry, B representations, Octrees, Ray Tracing & their Theory

UNIT – V: SHADING , COLOR ISSUES AND ANIMATION

Illumination model, Computing reflection vector, Gouraud and Phog shading, Texture mapping & their haracteristics, Handling shadows, Radiosity, Lambert’s Law, Modelling transparency, Colour issues: colour model for Images, Additive and Subtractive colour models, Wavelength spectrum, CIE colour standards.

Animation: Procedural animation, morphing, creating key frames, steps for creating animation, Frame by Frame animation

Name of Text Books:

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

Name of Reference Books:

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

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SEMESTER – V

“Operation Research”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 506

Unit - I

Introduction: History of operations research, Nature and Scope of operations research, Allocation, assignment and Transportation models, Construction and solution of these models.

Unit - II

Linear Programming: Introduction, Mathematical formulation of the problem, Graphical Solution methods, Mathematical solution of linear programming problem, Slack, and Surplus variables. Matrix formulation of general linear programming problem.

Unit - III

The Simplex Method: Fundamental properties to solution corroboration of extreme points, Simplex algorithm, Computational procedures, Artificial variables, two phase simplex Method, Formulation of linear programming problems and its solution by simplex method, Unrestricted variables, problems of degeneracy, Principle of duality in simplex method, Formation of dual with mixed type of constraints.

Unit – IV

Solution of primal and dual (Solution of dual constraints, Solution of primal also) Sensitivity Analysis.

Integer Programming: Formulation and solution of Integer Programming Problem.

Game Theory: Introduction, Two persons zero sum games, The Maxmini and Minimax principles.

Unit - V

Graphical Solution: Reduction of game problem to LPP, the transportation problem, matrix form of transportation problem, Initial basic feasible solution, Selecting the entering variables, Selecting the leaving variables, Transportation algorithm, Degeneracy in transportation Problem, Inventory Control.

Name of Text Books:

1. Operation Research, Theory and Application by J.K. Sharma, Macmillan India.
2. Quantitative techniques in Management by N.D.Vohra, TMH.
3. Linear Programming by N.P. Loomba.
4. Operation Research: An Introduction by H.A. Taha, PHI.

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SEMESTER – V

“Human Computer Interaction”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 507

UNIT-I

Introduction: Importance of user Interface – definition, importance of good design, Benefits of good design, A brief history of Screen design.

UNIT-II

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics - Principles of user interface.

UNIT-III

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions. Screen Designing:- Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT-IV

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls. Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT-V

Software tools – Specification methods, interface – Building Tools. Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

Name of Text Books:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia.

Name of Reference Books:

1. Human – Computer Interaction. Alan Dix, Janet Finckay, Gre Goryd, Abowd, Russell Bealg, Pearson Education.
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.
3. User Interface Design, Soren Lauesen , Pearson Education.

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
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SEMESTER – V

“Bioinformatics”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 508

UNIT I

Why is Bio informatics and why study it? How is large-scale molecular biology data generated, where how can researchers gain access to it, and what is quality of data? Private and future data sources. Meta data: Summary and reference systems, finding New types of data online, likely growth areas.

UNIT II

Biological Bases for Bio informatics, the diversity of life forms, the unifying theme Information storage-nucleic acids, Information expression-Proteins and Biochemical Reaction chains, Nucleic acid, Structure, Structure, Replication, Transcription, Translation.

UNIT III

Proteins-Structure, folding and function, Nucleic acid protein interactions.

UNIT IV

Nucleotide sequence data: Genome, Genomic sequencing, expressed sequence tags, Gene expressions, transcription factor binding sites and single nucleotide polymorphism. Computational representation of molecular biological data storage techniques: (Flat, relational and Object oriented), and controlled vocabularies, general data Retrieval techniques: indices, Boolean search, fuzzy search and neighboring, Application to biological data warehouses.

UNIT V

Biological data types and their special requirements: sequences, macro molecular Structures, chemical compounds, generic variability and connections to clinical data. Representations of patterns and relationships: alignments, regular expressions, Hierarchies and graphical modes.

Name of Text Books:

1. O’Reilly , “Developing Bio informatics Computer Skill” .
2. J.F. Griffiths, “An Introduction to Generic Analysis”.

Name of Reference Books:

1. Michel Starkey and Ramnath Elaswarapu, “Genomic Protocols”.
2. Stephen Misner & Stephen Krawetz, “Bio informatics-Methods and Protocols”.
3. Lawrence Hunter-“ Artificial Intelligence and Molecular Biology”, Free on Web.
4. “DNA & Protein Sequence Analysis- A practical Approach”, IRL Press at Oxford University.
5. “Bio Informatics”, Addison Wesley.

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
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SEMESTER – V

“Industrial Psychology”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 509

UNIT I

Introduction to Industrial Psychology – Definitions & Scope. Major influences on industrial Psychology- Scientific management and human relations schools Hawthorne Experiments Introduction of the term ‘Industry’ and ‘Psychology’ – Definitions – nature – importance – scope – factors responsible for psychology – behaviour of an individual in an industry – individual difference.

UNIT II

Individual in Workplace: History of I/O(I/O – Industrial / organization), Research Methods in I/O Criteria: Standards for decision making Predictors: Psychological Assessments Personnel Decisions, Motivation and Job satisfaction , stress management, Organizational culture, Leadership & group dynamics.

UNIT III

Work Environment & Engineering Psychology-fatigue, Boredom, accidents and safety, Job Analysis, Recruitment and Selection – Reliability & Validity of recruitment tests, Work, Motivation, Leadership Job design and organizational development, Union/Management relations Ergonomics and work conditions The changing nature of work .

UNIT IV

Performance Management: Training & Development, Training and development Performance Appraisal Organizations and work teams Organizational behavior Stress and well-being at work Research Methodology for psychology - Assignments based an certain model in the form of field work.

UNIT V

Individual Behaviour and Group Behaviours - Interaction between them – psychology involved in each individual – Necessary suggestions for improving psychology – Group Dynamics – Characteristics of group behaviour.

Name of Text Books:

1. Miner J.B. (1992) Industrial/Organizational Psychology. N Y : McGraw Hill.
2. Blum & Naylor (1982) Industrial Psychology. Its Theoretical & Social Foundations CBS Publication.

Name of Reference Books:

1. Aamodt, M.G. (2007) Industrial/Organizational Psychology : An Applied Approach (5th edition) Wadsworth/Thompson : Belmont, C.A.
2. Aswathappa K. (2008). Human Resource Management (fifth edition) New Delhi : Tata McGraw Hill.

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SEMESTER – V

“E-Commerce”

Theory Periods: 30
Credits: 4

Tutorials: “10”
Code: IT 510

UNIT I

Web commerce concepts – the e-commerce phenomenon - electronic marketplace technologies - web based tools for e-commerce - e-commerce softwares - hosting services and packages

UNIT II

Security issues - approaches to safe e-commerce - PKI- biometrics for security in e-commerce – smart cards and applications

UNIT III

Wireless infrastructure – payment agents – mobile agent based systems – digital cash – security requirements for digital cash - Digital cheques, netcheque systems

UNIT IV

Secure electronic transaction- secure online payment – micropayments – industrial epayment systems – challenges and opportunities of e-payment.

UNIT V

Electronic Data Interchange, EDI Applications in Business, EDI and E-Commerce, Standardization and EDI, EDI Software Implementation, Value Added Networks (VANs), Internal Information Systems.

Name of Text Books:

1. Weidong Kou, *Payment Technologies for E-Commerce*, Springer, 2003.
2. Kalakota R. & Whinston A.B., *“Frontiers of Electronic Commerce”*, Addison-Wesley, New Delhi
3. Janice Reynolds, *The Complete E-Commerce Book, 2/e*, CMP Books, 2004.
4. Schneider G. P. & Perry J. T., *Electronic Commerce, Course Technology*, Cambridge
5. Westland J. C. & Clark T.H. K., *“Global Electronic Commerce”*, University Press, 2001.
6. Minoli D. & Minoli E., *“Web Commerce Technology Handbook”*, Tata McGraw Hill, New Delhi

NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR, CG 492010
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SEMESTER – V

Semester: V	Code: IT 591
Subject: Computer Graphics Lab	
Credits: 2	

List of 10 -15 Assignment/Practical will be allotted by the Instructor in the respective Lab.

Semester: V	Code: IT 592
Subject: Database Management System Lab	
Credits: 2	

List of 10 -15 Assignment/Practical will be allotted by the Instructor in the respective Lab.

Semester: V	Code: IT 593
Subject: Computer Networks Lab	
Credits: 2	

List of 10 -15 Assignment/Practical will be allotted by the Instructor in the respective Lab.

Semester: V	
Subject: Managerial Skills	
Credits: 1	

List of 10 -15 Assignment/Practical will be allotted by the Instructor in the respective Lab.

Semester: V	
Subject: Technical Visit / Practical Training	
Credits: 1	