

MGU

Mahatma Gandhi University

Programme Project Report

BCA

2018-19 Session

**“ Be the Change that you
wish to see in the world”**

—Mahatma Gandhi



www.mgu.edu.in

PROGRAMME PROJECT REPORT

PROGRAMME NAME: BACHELOR OF COMPUTER APPLICATIONS (BCA)

Institution's Mission and Vision Statement

Mission: To offer quality educational services and transforming lives through knowledge.

Vision: The vision of the Promoting Body is set-up a University with a difference. It envisages the Proposed University to come up as a centre of excellence for training of management Professional and shaping and molding of Business and Corporate Leaders of tomorrow.

Relevance of Programme to the Institution's Mission and Goals

- Committing to continuous improvement through industry relations, and assurance of learning across all programmes.
- To fulfil the knowledge and development needs of the individuals, institutions and society in general, by relating, particularly, the courses, to the needs of the employment and economic development of the state on the basis of its natural and human resources.
- To provide an innovative system of University level education in regard to the methods and pace of learning, combination of courses, eligibility for enrolment, age of entry, conduct of examinations and operation of the programme, with a review to promote learning and encourage excellence in all fields of Knowledge.

Objective of the Programme

- Demonstrate the ability to adapt to technological changes and innovations in the discipline.
- Analyze, design, implement and evaluate computerized solutions to real life problems, using appropriate computing methods.
- Proficiency in the basic mathematics employed in computer science.
- Differentiate among essential data structures used in computer programming, and explain how they work.
- Gain knowledge of algorithms and their role in computer science.
- Identify, explain and apply fundamental structured programming techniques.
- Utilize important data structures and associated algorithms in the development of computer programs.
- Develop computer programs using functional programming and object-oriented programming paradigms.
- Apply techniques of software validation and reliability analysis to the development of computer programs.
- Demonstrate the critical thinking and communication skills required in
- Acquire the knowledge, skills, experience and values to become lifelong learners able to obtain employment in a computer-related field or go on to graduate study.

Nature of Prospective Target Group of Learners

- Candidates of HSC or any 10+2 passed with a focus on developing their future. Candidates desirous to join service sector will opt for this programme because of the unique methodology of the programme, where students will get real-life workplace experience and learn simultaneously through eLearning support.
- The Duration of BCA courses shall be of 3 Years. The Programme is on Semester system, thus there shall be six semester Examination. The University has continuous system on assessment & evaluation of measurement of learning outcomes by students. The Learning is assessed by blend of quizzes, assignment, Exercise analysis, report submission, Annual Examination.

Programme Appropriateness in Open and Distance Learning mode

- Appropriateness of Programme to be conducted in Open and Distance Learning mode to acquire specific skills and competence
- Develop skilled manpower in the various areas of information technology like Data base management, Software Development, Computer-Languages, Software engineering, Web based applications etc.
- Produce employable IT workforce, that will have sound knowledge of IT and business fundamentals that can be applied to develop and customize solutions for Small and Medium Enterprises (SME).
- The learners learn the theory concepts using eLearning.
- 'Learning through working' model makes them independent at the very beginning of their graduation.

Various Modes of Education Delivery

- *Instructional Design*: Study focuses on the instructional design process on management, communication, technology and learning about organizations. Emphasis is given to the students' application and evaluation of their learning.
- *Self-Learning Material (SLM)*: SLM includes all the instructional design part like graphics oriented content, every unit contains Introduction, Activity, Notes, Summary, Keywords, Review Questions, Further reading & Explanatory figures.
- *e-Learning*: eLearning is a way to provide quick delivery of lessons. e-Learning helps in creating and communicating new training, policies, concepts, and ideas. eLearning enables educators to get a higher degree of coverage to communicate the message in a consistent way which ensures that all learners receive the same type of training with this learning mode.
- *Video Lectures*: It produces authentic learning opportunities for students. It inspires and engages students when incorporated into students centered learning activities through increased students' motivation, enhanced learning experience, and enhanced team working and communication skills.

- *Dynamic Web-Portal*: It provides a resource for locating and navigating to web based resources that support educational endeavours. It helps to keep up-to-date with new content and customize information depending on who is visiting the site.
- *Learning Management System (LMS)*: It create multimedia learning content which is comprehensive and practical, using video, images, audio and text which all serve as great tools in learning new skills or information.
- *Dictionaries of Specialized Subjects*: An insight into the terminology used subjects specific words and word origins. Dictionaries provide extra help with words and symbols to build subject understanding at home and in the classroom.
- *Instructional Simulations*: It is an educational simulation in which simulation of some type of reality (system or environment), which also includes instructional elements that help a learner explore, navigate or obtain more information.

CURRICULUM, DETAILED SYLLABUS & OTHER DETAILS

The Curriculum, Detailed Syllabus & other details are as under:

Name of Programme : BCA (Bachelor of Computer Applications)
 Duration : 3 Years
 Examination : 6 Semesters

BCA: Three-Year (6-Semester) CBCS Programme			
Programme Structure			
Course No.	Course Title	Credits	Course Type
Semester I			
ITP11	Introduction to Information Technology	4	Core Course
ITP12	Programming in C	4	Core Course
ITP13	RDBMS	4	Core Course
ITP11	Communication & Soft	4	Ability Enhancement Elective
ITP15	Practical-C Programming	4	LAB
Semester II			
ITP21	Operating Systems	4	Core Course
ITP22	Computer Organization & Architecture	4	Core Course
ITP23	Object Oriented Programming Using "C++"	4	Core Course
ITP24	Presentation/Seminar	4	LAB
ITP 25	Environmental Science	2	Foundation course 2
Semester III			
ITP31	Web Technology	4	Core Course
ITP32	Unix with Shell Programming	4	Core Course
ITP33	Shell Programming	4	LAB
ITP34	Java Programming	2	Foundation Course 3
ITP35	Basic Mathematics	4	Core Course

Semester IV			
ITP41	Principles of Management	4	Core Course C
ITP42	Operation research	4	Core Course C
ITP43	Programming with VB	4	Core Course C
ITP44	Digital Electronics Fundamentals	4	Core Course C
ITP45	Practical- VB	2	Foundation course – 4
Semester V			
ITP51	Computer Networks	4	Core Course C
ITP52	Management Information System	4	Core Course C
ITP53	Software Engineering	4	Core Course C
Choose any one			
ITP54A	Introduction to Microprocessor	4	Core Course
ITP54B	Digital Logic		
Choose any one			
ITP55A	Computer Networks	4	LAB
ITP55B	MIS		
Semester VI			
ITP61	Seminar and Report	2	Skill Development Course – 1
ITP62	Desktop Publishing	4	Core Course C
ITP63	Computer Graphics	4	Core Course C
ITP64	Main Project	8	Core Course
TOTAL CREDIT		110	

Faculty Details

S.No.	Name	Designation
1	Ms. Priti Rekha Devi	HOD
2	Ms Nochila K Sangma	Associate Professor
3	Mr. Viswendu Kera	Asst. Professor
4	Dr Khanam Mohsina Yasmin	Asst. Professor

Student Support Staff

S.No.	Name	Designation
1	Ms. Pratyakshi Goswami	Incharge-Student Support Division
2	Ms. Anita Das	Sr. Student Counsellor

3	Mr. Nimpal Kalita	Incharge Grievance Cell
4	Mr. Geeti Gogoi	Asst. Incharge Students Activity Cell

Student Support Service System

- The Student Support System aims to help students in a variety of ways, including career development, legal regulation, counseling, psychological support, and special concerns for international students.
- New students receive student handbook, which includes helpful information to acclimate them to the campus and University community.
- Students are surrounded by an extensive support system all the way from orientation through graduation.

Procedure for Admission, Curriculum Transaction and Evaluation

- Counseling session at Campus
- Application form submission along with required documents check list – Online or at Campus
- Eligibility check from the Admission Section
- Documents verification
- Payment of Fees
- Issuance of Enrollment Number & ID Card
- Issuance of SLM & Academic Kit
- Scholarship test

Details of Laboratory Support

- Computer Lab Support to aid students with their studies.
- The lab can help you with your homework, assignments, difficult course content and test preparation.
- Both experienced students from the programme and faculty members themselves volunteer at the lab, which makes it a key resource for any student.
- There is English & Soft Skills lab for students' development.

Library Resources

- We have library at campus which combine more than 10,000+ books for various courses and 400 national and international journals can be accessed by commonly used application.
- MGU partners with Excel Books Pvt. Ltd. a renowned publishing house for digital library access. It is a distinctive group of publishing companies, has a rich history in the book industry.

Facilities Available to Learners

- *Scholarship*: Through this full tuition scholarships or other substantial awards being offered to the high qualifying students, either in the form of need-based or academic scholarships for university.
- *Book-lending*: An initiative to ensure the academic success of every student funded through alumni donations. This programme provides books for students who could not otherwise afford to purchase them.
- *CD/audio/video cassettes*: Enhance understanding with a teaching guide for using audio cassettes or CDs includes suggested teaching tips that engage learners with auditory and spatial intelligence learning styles.
- *Internet facility*: It opens doorways to a wealth of information, knowledge and educational resources, increasing opportunities for learning in and beyond the classroom.
- *Digital Library*: Provides access to digital repository or digital collection of e-books and e-notes.

Cost Estimate of the Programme and its Provisions

The Cost estimate for BCA Course on No Profit No Loss comes to Rs. 7000/- Semester. The University has made provision of Rs. 10 Lakh for running of different course of IT Dept. (BCA, MCA) including the Printing of Teaching Material for the students.

Quality Assurance Mechanisms

1. Learning Material (Print Media)

- The Self Learning Material is designed with the approach of two-way communication between the learner and content.
- It also involves the learner actively through various experience-based activities and assignments.
- The learner gets clear information about the structure of the programme and course.

2. Audio–Video Material

- There is adequate consideration of learners' prior knowledge, skills and attitudes.
- Level and style of language shall be appropriate.

3. Online Material

- There is description of credit value of each module or unit in the course.
- There are clear guidelines on academic integrity and netiquette (internet etiquette) expectations regarding lesson activities, discussions and plagiarism.

4. Computer-based material

- There is lesson's overview, content and activities, assignments to provide the learning opportunities for learner to master the content.

5. Curriculum and Pedagogy

- The structure of curriculum is defined.

- The content is reliable and justifies the learning outcome(s).
- There is clear definition of intended outcomes of learning, benchmarked to identifiable stages of learning.

Programme Outcomes

- An ability to understand theory of Digital Design and Computer Organization to provide an insight of how basic computer components are specified.
- An ability to understand the functions of various hardware components and their building blocks.
- An ability to understand and appreciate Boolean algebraic expressions to digital design.
- An in depth understanding of sequential and Combinational circuits.
- An in depth understanding of realization of different combinational/sequential circuits.
- An in depth understanding of different stages of an instruction execution.
- An in depth understanding of how different hardware components are related and work in coordination.
- An ability to understand computer buses and input/output peripherals.

PROGRAMME SYLLABUS AND RECOMMENDED BOOKS

Details of Programme Syllabus & List of Recommended books are given below:

Semester I

COURSE CODE:ITP11		
COURSE TITLE: Fundamentals of Information Technology		
UNITS	CONTENTS	
I	Brief history of development of computers, Computer system, concepts, Computer system Characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs Specifications and main characteristics- Basic components of a computer system - Control unit, ALU, Input/output functions and characteristics, memory - RAM, ROM, EPROM, PROM and Other types of memory	
II	Input/output & Storage Units-: Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non-Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers	
III	Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), files & directory structure and its naming rules,booting process details of DOS and Windows,	
IV	DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits	
V	Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication; Modem - Working and characteristics, Types of network Connections -Dialup, Leased Lines, ISDN, DSL, RF, Broad band ,Types of Network - LAN, WAN, MAN ,Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN - Media, NIC, NOS, Bridges, HUB, Routers, Repeater	

	and Gateways- Internet-Evolution, World Wide Web Internet Services, Convergence of technologies.	
VI	Management information system - Introduction, Characteristics, Needs, Different views of MIS, Designing, Placement of MIS, Pitfalls in Designing an MIS, Computer based MIS – Advantages & Disadvantages	
VII	Need and Scope, Computer Applications in Project Management, Computer in PersonnelAdministration, Information System for Accounting-Cost and Budgetary Control, Marketing andManufacturing, Computer Applications in Materials Management, Insurance and Stock-broking,Production planning and Control, Purchasing, Banking, Credit and Collection, Warehousing	
VIII	Introduction to Ms Word, Document Window, Application Window, Formatting in MsWord,Mail Merge	
SUGGESTED BOOKS		
1	Fundamentals of Technology Project Management by Colleen Garton and Erika McCulloch.	
2	Fundamentals of Information Studies: Understanding Information and Its Environment, Second Edition by June Lester, Wallace C. and Jr. Koehler.	

COURSE CODE:ITP12		
COURSE TITLE: C Programming		
UNITS	CONTENTS	
I	Introduction, Exploring Data Types- The char Data Type, The int Data Type, The float Data Type, The double Data Type, The void Data Type. Introducing Constants, Introducing Variables- Declaring Variables, Initializing Variables. Introducing const and volatile Type Qualifiers- The const Type Qualifier, The volatile Type Qualifier. Explaining Data Type Modifiers, Exploring Backslash Constants, Exploring Symbolic Constant, Exploring Delimiters, Understanding Multiple Assignments..	
II	Introduction, Input/output Functions, The printf() Function, The printf() Place holders- Type-identifiers, Type Prefixes, Field-width, Precision, Flags. Escape Sequence, The scanf() Function- Rules, Program. The scanf() place holders- Type Indicators, Use of *, Field-width. The getchar() Function, The gets() Function, The putchar() Function, The puts() Function.	
III	Introduction, Working with Operator- The Unary Operators, The Assignment Operators, The Arithmetic Operators, The Increment and Decrement Operators, The Relational Operators, The Logical Operators, The Bitwise Operators, The Conditional Operators, The Special Operators, The Shorthand Assignment Operators. Operator Precedence in C, Type.	
IV	Introduction, Exploring the Syntax of a Control Structure, Working with Conditional Statements- Using the if Statement, Using the if-else Statement, Creating the Nested if Statements, Using the if-else Ladder, Using the switch Statement, Creating Nested switch Statements. Working with Iterative Statements- Using the while Loop, Using the do-while Loop, Using the Loop. Working with Jump Statements- Using the break Statement, Using the continue Statement, Using the go to Statement.	

V	Introduction, Introducing Arrays, Types of Arrays- One-Dimensional Arrays, Two-Dimensional Arrays, and Limitations of Arrays.	
VI	Introduction, Overview of Functions- Function Definition, Function Invocation, Types of Functions- Built-in Functions, User-defined Functions, Parameter Passing Mechanisms, Passing Arrays in Function, Recursive Functions, Functions and Variables- Local and Global Variables, Static and Register Variables.	
VII	Introduction, Understanding Strings in C, Declaring and Initializing a String, Reading and Displaying the Strings Using the scanf () and printf () Functions, Using the puts() and gets() Functions, Using the getchar() and putchar() Functions. Creating an Array of Strings.	
VIII	Performing String Operations- Concatenating Strings, Calculating the Length of a String, and Comparing Strings Using String Handling Functions- strlen(), strcmp(), strncmp(), strcat(), strncat(), strcpy(), strncpy(), strchr(), strlwr(),strupr(), strrev().	
IX	Introduction, Structures- Defining a Structure, Declaring Structure Variables, Initializing Structure Variables, Nested Structures, Arrays of Structures, The type def Statement. Unions- Defining a Union, Declaring Union Variables, Initializing Union Variables.	
X	Introduction, Understanding Pointers, Declaring a Pointer Variable, Using the address of (&) Operator, Initializing a Pointer Variable, Dereferencing a Pointer, Performing Operations on Pointers- Assignment, Arithmetic, Comparison, Working with Functions and Pointers- Call By Value, Call by Reference. Working with Arrays and Pointers- Pointers to One-dimensional Arrays, Pointers to String. Allocating Memory at Runtime malloc(), calloc(), free(),realloc().	
XI	Introduction, Using the File Inclusion Directives, Using the Macro Substitution Directives- Defining a Simple Macro, Defining Macro with Arguments, Defining Nested Macros. Using the Compiler Control Directives- The #ifdef Directive, The #ifndef Directive, The #if Directive, The #ifndef Directive, The #ifdef Directive.	
XII	Introduction, Exploring Data Files, Opening and Closing Files- Reading from Files, Writing to Files, Accessing Data Files Randomly- The fseek() Function, The ftell() Function, The fread() Function, The fwrite() Function.	
	SUGGESTED BOOKS	
1.	ANSI C By Balaguruswamy	
2.	Let us C by Yashwant Kanetkar	

COURSE CODE: ITP13		
COURSE TITLE: Fundamental Mathematics		
UNITS	CONTENTS	
I	Objectives, Introduction, Types of Sets, Subsets, Equal Sets, Null Sets, Universal Sets, Finite and Infinite Sets, Open and Closed Sets Operations on Sets, Union of Sets, Intersection of Sets, Complement of Set, Partition of	

	Sets, Cartesian Product of Sets, Cardinality of Sets, Venn-Diagrams, Applications of Sets.	
II	Objectives, Introduction, Basic Terminologies, Maximal and Minimal Points, Chains and Anti-chains Properties of Relation, Types of Relation, Equivalence Relation, Equivalence Relation with Partition, Partial Order Relations, The Pigeonhole Principle, Functions, Domain and Range, Types of Functions, onto Functions, into Functions, One-to-One Functions, Composite Functions, Inverse Functions, Algebraic Functions, Trigonometrically Functions, Logarithmic Functions, Exponential Function, Hyperbolic Functions, Zeroes of Functions.	
III	Objectives, Introduction, Arithmetic Progression, nth Term of an Arithmetic Progression, Sum of n Terms of an Arithmetic Progression, Arithmetic Mean, Applications of Arithmetic Progression, Geometric Progression, nth Term of a Geometric Progression Sum of n Terms of a Geometric Progression, Geometric Mean, Applications of Geometric Progression.	
IV	Harmonic Mean, Relation between Arithmetic Mean, Geometric Mean and Harmonic Mean.	
V	Objectives, Introduction, Minors and Cofactors, Properties of Determinants, Rank of a Matrix, Inverse of a Matrix, CRAMER'S RULE.	
VI	Types of Matrices, Operations on Matrices, Addition of Matrices, Subtraction of Matrices, Vector and Scalar Multiplication of Matrices, Inverse of a Matrix, Eigen Vectors of a Matrix, Caley-Hamilton Theorem.	
VII	Objectives, Introduction, Derivative, Derivative of Sum, Derivative of Differences, Derivative of Products, Derivative of Quotients, Derivative of Logarithmic Function, Derivative of Composite Functions, Rolle's Theorem, Mean Value Theorem.	
VIII	Taylor's Series, Maclaurin's Series, Indeterminate Form, Leibnitz Theorem, Curve Tracing.	
IX	Objectives, Introduction, Integral as Limit of Sum, Fundamental Theorem of Integral Calculus, Indefinite Integrals, Method of Integration, Substitution Method of Integration, By Parts Method of Integration, Partial Fraction Method of Integration, Integration of Algebraic and Transcendental Function, Gamma and Beta Function.	
X	Objectives, Introduction, Double and Triple Integration, Double and Triple Integration in Cartesian Coordinates, Double and Triple Integration in Cylindrical Polar Coordinates, Double and Triple Integration in Spherical Polar Coordinates, Applications of Double and Triple Coordinate, In Calculation of Area, In Calculation of Volume.	
XI	Objective, Introduction, Limits and Continuity, Partial Differentiation, Chain Rule, Euler's Theorem, Maxima and Minima, Lagrange's Method of Undetermined Multipliers, Taylor's Formula.	
XII	Objectives, Introduction, Polar Coordinates, Curve Tracing in Polar Coordinates, Arc Length, Area and Volume of Surface in Cartesian Coordinates, Area and Volume of Surface in Polar Coordinates.	

XIII	Correlation, Types of Correlation, Karl Pearson's Coefficient of Correlation, Rank Correlation Method, Spearman's Rank Correlation Coefficient, Regression, Regression Lines, Application of Regression Lines for Forecasting Sales, Coefficient of Regression	
XIV	Introduction, Probability, Rules of Probability, Conditional Probability, Bayes Probability, Probability Distribution, Random Variables, Binomial Distribution, Cumulative Binomial Probability, Poisson distribution, Normal Distribution	
XV	Introduction, Logarithms, Laws Of Operations, Compound Interest, Arithmetic Progression, Geometric progression, Annuities.	
XVI	Introduction, Concept of Statistics, Importance of Statistics in Business Decisions , Presentation of Data, Measures of Central Tendency, Mean, Median, Mode, Measures of Dispersion, Quartile Deviation, Mean Deviation, Standard Deviation, Skewness, Measures of Skewness, Karl Pearson's Coefficient of Correlation, Kurtosis.	
	SUGGESTED BOOKS	
1	"Basic Mathematics" by Charles P. Mckeague	
2	"Basic Technical Mathematics with Calculus" by ALLYN J. Washington	

COURSE CODE: BSG14		
COURSE TITLE: Communication and soft skills - 1		
UNITS	CONTENTS	
I	Grammar: Correction of sentence, Vocabulary / word formation, Single word for a group of words, Fill in the blank, transformation of sentences, Structure of sentences – Active / Passive Voice – Direct / Indirect	
II	Narration: Essay – Descriptive – Comparative – Argumentative – Thesis statement- Structure of opening / concluding paragraphs – Body of the essay.	
III	Reading Comprehension: Global – Contextual – Inferential – Select passages from recommended text.	
IV	Business correspondence : Letter Writing – Formal. Drafting. Bio-data- Resume - Curriculum Vitae.	
V	Report Writing: Structure , Types of report – Practice Writing.	
VI	Communication and Public Speaking Skills: Communication Process-meaning, principles of effective communication (barriers and solutions), Introduction to the sounds of English, Features of effective speech, verbal-nonverbal.	

VII	Group Discussion : Principle – practice.	
SUGGESTED BOOKS		
1.	S R Inthira& V Saraswathi “ Enrich your English – a) Communication skills b) Academic skills“ Publisher CIEFL & OUP	
2.	R.C.Sharma and K.Mohan , “ <i>Business Correspondence and Report Writing</i> ”, Tata McGraw Hill , New Delhi ,	

COURSE CODE: ITP15
COURSE TITLE: Practical-C Programming

Semester II

COURSE CODE:ITP21		
COURSE TITLE: Introduction to Operating Systems		
UNITS	CONTENTS	
I	Computer and System Software, Objectives and History of Operating Systems, Categories of OS, Job Scheduling, Virtual Storage.	
II	Device Management, Buffering, Spooling, Windows Operating Systems, Features of Windows OS, Linux OS, Features of Linux OS, Linux Distributions.	
III	Process Concept, Process Management, The Process Management Model, Creation and Termination of Processes, States of Process, Process Control Block, Process and Process Scheduling Algorithms, Process Behavior and CPU I/O Burst Cycle, First-Come-First-Served, Shortest-Job-First, Priority Scheduling, Pre-emptive Algorithms, Round-Robin, Multilevel Queues.	
IV	Need for Concurrent Process Synchronization, Cooperating Processes, The Bounded Buffer Producers and Consumers Problem, Critical Section Problem, Inter- Process Communication, Semaphores, Monitors.	
V	Overview of Threads, User and Kernel Threads, Multithreading Models, Thread Libraries, Design Issues in Threads, Other Threading Issues	
VI	Overview of Deadlock Situation, Simple Resource Deadlock, River Crossing Problem, Conditions for Deadlock, Resource Allocation Graph.	
VII	Deadlock Prevention, Mutual Exclusion Condition, Hold and Wait Condition, No Preemption, Circular Wait, Deadlock Avoidance, Dijkstra’s Banker’s Algorithm, Deadlock Detection and Recovery.	
VIII	Storage Organization, Memory allocation to programs, Partitioning of Memory, Free Space Management, Buddy System Memory Allocator, Memory Protection Hardware in Multiprogramming Systems, Overlay Structured Programs, Paging, Page Replacement Algorithms, Segmentation	
IX	File System Overview, File Access Methods, Structure of Directory, File	

	Sharing, File Protection, File System Implementation, Directory Implementation	
X	File Allocation Methods, Free space management techniques, File System Recovery.	
XI	Overview of Distributed Systems, Distributed Computing System Models, Design Issues of the DOS.	
XII	Network Topologies, Types of Computer Networks, Network Technologies, Communication Protocols, Fault Tolerance.	
XIII	Security Goals, Security Mechanisms and Principles, Malicious Attacks, Mechanisms for Domain Protection.	
XIV	User Authentication, Biometrics, Program Threats, Cryptography, Denial of Service Attacks.	
XV	Introducing Linux, Exploring Linux Distributions, Exploring Fedora Linux, Exploring the Features of Fedora Linux, Deploying Fedora Linux	
	SUGGESTED BOOKS	
1	Modern Operating Systems (3rd Edition) (GOAL Series)	
2	Operating Systems Design and Implementation (3rd Edition) (Prentice Hall Software Series)	

COURSE CODE: ITP22		
COURSE TITLE: Software Engineering and Analysis		
I	Introduction, The process, software products, emergence of software Engineering, evolving role of software	
II	Software Characteristics and application Software life cycle models, Software Characteristics, Applications, Software crisis.	
III	Software project management: Project management concepts, software process and project metrics Project planning, project size estimation metrics.	
IV	Software Estimation Project estimation Techniques, empirical estimation techniques, OCOMO- A Heuristic estimation techniques, staffing level estimation	
V	Risk Analysis Introduction team structures, staffing, risk analysis and management, project scheduling and tracking.	
VI	Software Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software	
VII	Software Prototyping Prototyping methods and tools; Specification principles, Representation, the software Requirements specification and reviews	
VIII	Software Analysis Modeling Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling	
IX	Structured Analysis The mechanics of structured analysis: Creating entity/relationship diagram, data flow Model, control flow model, the control and process specification; the data dictionary; Other classical analysis methods	
X	System Design Design concepts and principles: the design process: Design	

	and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding.	
	SUGGESTED BOOKS	
1	Software engineering by K.K. Aggarwal.	
2	Software engineering: a practitioner's approach by Roger S. Pressman..	

COURSE CODE: ITP23		
COURSE TITLE: Programming Using C++		
UNITS	CONTENTS	
I	Principles of Object Oriented Programming Software Evolution, Procedure Oriented Programming, Object Oriented Programming Paradigm, Basics of OOPs, Benefits of OOPs.	
II	Classes And Objects Introduction, Class , Object , Nature of Class, Types of Relationships, "Kind of" Relationship, "Is a" Relationship, "Has a" Relationship/Part of Relationship, Classification of Classes, Abstraction.	
III	Beginning with C++ A Simple C++ Program, an example with Class, Creating the Source File, Compiling and linking.	
IV	Tokens and Expressions and Control statements Tokens, Keywords, Identifiers, Basic ,user, derived data types, control statements, Loops and Jumping Statements.	
V	Arrays Introduction, Arrays, Array Declaration, Important Points about Arrays , Multidimensional Arrays.	
VI	Classes and Objects Specifying a Class, Defining member Functions, Inline function, Nesting of member function, Static data members, static member functions, friend function .	
VII	Constructors And Destructors Introduction to Constructors, Destructors, Types of constructor, Dynamic Initialization of Objects.	
VIII	Inheritance and Extending Classes Introduction- Inheritance, Type of Inheritance, Virtual Base Classes, Abstract Classes.	
IX	Pointers ,Virtual Functions and Polymorphism Introduction Pointers to Objects, This Pointer, Pointer to Derived	

	Classes,VirtualFunctions,Pure Virtual Functions, polymorphism,types of polymorphism.	
X	Operator Overloading And Type Conversion Defining operator overloading, overloading unary and Binary Operators, Overloading Binary Operators using Friend function	
XI	Managing Console I/O Operations C++ Streams,Classes,Unformatted and Formatted Console I/O Operations.	
XII	File Handling Introduction, files, Stream Input/Output, Buffering and Flush, Exception Handling, String Handling, Sequential Fixed Length Structure, Linked List Fixed Size Nodes, Strings Manipulations, Character String Output Functions ,String Handling Functions Postfix Expression, Simulating .	
SUGGESTED BOOKS		
1.	Object Oriented Programming With C++ - E Balagurusamy.	
2.	Object Oriented Programming Using C++, SanjeevSofat, Cyber Tech. Publication.	

COURSE CODE: BAES24		
COURSE TITLE: Environmental Science-I		
UNITS	CONTENTS	
I	Environment: Definition, scope and importance, Need for public awareness.	
II	Natural Resources : Renewal and non-renewable resources, Forest resources, Water resources, Mineral resources, Food resources, Energy resources, Land resource	
III	Ecosystem: Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers Energy flow ,Food chains, food webs and ecological pyramids	
IV	Biodiversity : Introduction- Definition: Genetics, species and ecosystem diversity. Value of biodiversity,Biodiversity at global national and local levels. Threats to biodiversity, Important Endangered and endemic species of India	
V	Environmental Pollution: Definition: Causes, effects and control measures of a. Air Pollution, b. Water Pollution, c. Soil Pollution, d. Noise Pollution, e. Thermal Pollution, . Solid waste management: Causes,	

	effects and control measures	
VI	Human Population and the Environment: Population growth, Population explosion, family welfare program, Environment and human health	
SUGGESTED BOOKS		
1	<i>Fundamentals of Environmental Studies by D.K. Sinha, & A.D. Mukherjee.</i>	
2	<i>Masters, G.M., "Introduction to Environmental Engineering and Science" Prentice – Hall of India Pvt. Ltd., 1991.</i>	

COURSE CODE: ITP25
COURSE TITLE: PRESENTATION/SEMINAR

Semester III

COURSE CODE: ITP31		
COURSE TITLE: Web Development Technology		
UNITS	CONTENTS	
I	Exploring Web, Exploring Web Technologies, Describing Web Services, Exploring Web Applications, Exploring Web Architecture Models, Exploring the MVC Architecture	
II	The Anatomy of an HTML Document, HTML Markups, Exploring Elements, Working with Absolute and Relative Links, Working with Ordered and Unordered Lists, Embedding Images, Controlling Appearance, Creating and Using Tables, Nesting and Targeting Frames.	
III	The META Element, Semantic Tags, the Dublin Core and RDF	
IV	Internal Style Sheet, Inline Style Sheet, External Style Sheet..	
V	Introduction to the JavaScript Syntax, The JavaScript Object Model, Event Handling, Output in JavaScript, Forms Handling, Cookies.	
VI	introduction to Server-Side Web Technologies, Programming Languages for Server-Side Scripting, Configuring Server to Support CGI Applications, Working with Forms and I/O Operations	
VII	Exploring Java Technologies, Describing VRML Idea, Microsoft .NET Technology	
SUGGESTED BOOKS		
1	Web Technologies by Uttam K. Roy	
2	Web Development using HTML and CSS	

COURSE CODE: ITP32
COURSE TITLE: Unix Shell Programming

UNITS	CONTENTS	
I	Introduction, Hardware configuration for Unix, Features of Unix, Architecture of Unix, Unix Commands, PATH, man, echo, Printf, script, passwd, who, date, sty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, Unix Utilities, System calls	
II	Introduction, Utilities, File Handling utilities, Process Utilities, Disk Utilities, Text processing Utilities, Backup Utilities.	
III	File System Commands.	
IV	Du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin, Compressing and Decompressing files.	
V	Introduction, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm., cmp, diff, tr, awk, cpio.	
VI	Introduction, Modes, Command Mode, Insert Mode, Basic Navigation, Adding, Deleting and Changing text in vi editor, Saving and reading Files in vi editor.	
VII	Introduction, The Shell's Interpretive cycle, Describing types of Shells in Unix, C Shell, TC shell, Korn Shell, Bash Shell, Redirection, Pipes, Tee command, Shell Variables, Job Control.	
VIII	Quoting, Quoting with Backslashes, Using Single Quotes, Using Double Quotes.	
IX	Substitution, File Substitution, Variable Substitution, Command Substitution, Arithmetic Substitution	
X	Introduction, Filter command, Concatenating File, Display Beginning and End of Files, Paginating File, Cut a File, Pasting Files, Sorting a File.	
XI	Translating Characters, Searching Duplicate Lines, Counting Characters, Comparing Files, Deleting Lines.	
XII	Introduction, Variables and Expressions, The comparison operators, Variables, Storing awk programs in a file.	
XIII	Arrays, Functions, String Functions, Mathematical Functions, User-Defined Functions, Splitting Lines into Fields, Comparing sed and awk, Using grep.	
XIV	Introduction, Environment variables, Adding Environment variables, Setting Environment variables	
XV	Startup and Shutdown scripts, Command Execution scripts	
XVI	Using Expressions, Commands Execution in Shell syntax	
	SUGGESTED BOOKS	
1.	"Unix shell programming" by Yashwant Kanetkar	
2.	"Unix and Shell Programming" , By Archana Verma	

COURSE CODE:ITP33

COURSE TITLE: Shell programming LAB		
UNITS	CONTENTS	
I	Basic Unix Commands	
II	File System commands	
III	Working with Vi Editor	
IV	Interactive C Shell and C shell Programming	

COURSE CODE:ITP34		
COURSE TITLE: Java Programming		
UNITS	CONTENTS	
I	Introduction to Java Programming: Introduction, History of Java, Java Platform, Java Architecture, Java Features	
II	Java Syntax: Introduction, Writing first Java program, Comments, Identifier, Keywords, Data types, Literals, Variables, Operators, Conditional Statements, Looping statements, Java Arrays	
III	Classes, Objects and Methods declarations: Introduction, Defining a class, Method declaration, Creating Object , constructor, Method Overloading, Nesting of Methods, Inheritance, Overriding, Abstract Methods and Classes, Visibility Control.	
IV	Multithreading, Exception Handling, Interface, Packages : Introduction to Thread, Creating a Thread, Life cycle of a Thread, Introduction to Errors and Exception Handling , Types, Syntax of Exception Handling, Multiple Catch statement, Using Finally statement, Throwing Exception. Interfaces- Introduction, defining ,extending, implementing and accessing interfaces. Packages- Introduction, Java API packages, Creating and accessing packages.	
V	Input/ Output Files in Java: Introduction, Stream concept, stream classes and file classes.	
VI	Introduction to Applet and Graphics Programming: Introduction to Applet, Applet Life Cycle, Introduction to Graphics Class and Graphics Methods. Introduction to Abstract Window Toolkit, Containers, Components and AWT Controls.	
	SUGGESTED BOOKS	
1	“The Complete Reference”, by Schildt Herbert	
2	“Introduction to Java” by Sedgewick	

COURSE CODE:ITP35

COURSE TITLE: Practical – Web Development Technology		
UNITS	CONTENTS	
I	HTML(table, ordered and unordered list, frame, web page etc.)	
II	CSS	
III	Style Sheets- Internal, External	
IV	XML	
V	JavaScript	

Semester IV

COURSE CODE:ITP41		
COURSE TITLE: Theory of Computation		
UNITS	CONTENTS	
I	Fundamentals : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.	
II	Finite Automata :NFA with $\hat{\epsilon}$ transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without $\hat{\epsilon}$ transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Mealy machines.	
III	Regular Languages :Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets.	
IV	Grammar Formalism :Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.	
V	Context Free Grammars :Ambiguity in context free grammars. Minimization of Context Free Grammars, Pumping Lemma for Context Free Languages.	
VI	Push Down Automata :Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence.	
VII	Turing Machine :Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages.	

SUGGESTED BOOKS		
1.	<i>Introduction to Automata Theory Languages and Computation.</i> Hopcroft, H.E. and Ullman J. D. Pearson Education	
2.	<i>Elements of Lewis H.P. & Papadimitriou C.H. Pearson /PHI.</i>	

COURSE CODE:ITP42		
COURSE TITLE: Basics of Compiler Design		
UNITS	CONTENTS	
I	INTRODUCTION TO COMPILING Compilers – Analysis of the source program. Compiler Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools . Lexical Analysis Lexical Analysis – Role of Lexical Analyzer . Buffering Input Buffering – Specification of Tokens.	
II	SYNTAX ANALYSIS Role of the parser –Writing Grammars . SYNTAX ANALYSIS-II Context-Free Grammars . : Parsing Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing . Parsing-II LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.	
III	Intermediate Code Generation Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls. Code Generation Issues in the design of code generator – The target machine – Runtime Storage management. Basic Blocks and Flow Graphs Basic Blocks and Flow Graphs – Next-use Information .	
IV	Code generator A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization. Code Optimization Introduction– Principal Sources of Optimization – Optimization of basic Blocks . Data Flow Analysis – Introduction to Global Data Flow Analysis . Run Time Environments Runtime Environments – Source Language issues . Storage Organization Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.	
SUGGESTED BOOKS		
1	Compilers: Principles, Techniques, and Tools by Alfred V. Aho.	
2	Engineering a Compiler by Keith Cooper and Linda Torczon	

COURSE CODE:ITP43		
COURSE TITLE: Programming with VB		
UNITS	CONTENTS	
I	Introduction to Visual Basic- Introduction to Graphical User Interface, Programming language(Procedural, Object Oriented, Event Driven), The Visual Basic Environment, How to compile/debug and run the programs.	

II	Working with Variables, constants, Data types, Scope of Variables, Operators, Array Variables-dynamic and multidimensional,	
III	Introduction to VB Controls- Designing the user interface with VB controls, tools and their properties like Textbox, Frame, Label, Check box, List box, Combo Box, Option Buttons, Line control, Image and Shape control, etc, Working with multiple controls	
IV	Conditional Statements- If....End if, IfElse If, Select ...Case Looping Statements- Do...Loop, While ...Wend, For...Next, For....Each....Next	
V	Building Procedures and Functions- VBA procedures, Event procedures, public, private and procedure scope. Creating a sub- procedure, passing variables to sub procedures, passing argument ByVal or ByRef, Writing a function procedure.	
VI	Multiple Forms- Creating, adding, renaming forms in project. Use of hide, show, load , unload, activate, deactivate methods . Referring to objects in a different form	
VII	Working with Menus and Toolbars- Basic elements of Menultems and Toolbar Buttons, Adding, Removing and modifying menus. Using Common Dialog Box	
VIII	OOP in VB- Concept of Object Oriented Programming, classes, creating a new class, creating a new object using a class.	
IX	Working with Database - Creating data control with forms, connecting, opening, validating, searching, navigating, editing, the database, working with Advanced Data Controls, Handling Errors: Runtime, trapping and handling error Working with Data Environment and Data Report	
	SUGGESTED BOOKS	
1.	Evangelous Pestroutsos, "Mastering Visual Basic 6.0"	
2.	Steven Holzner, " Visual Basic 6 Programming Black Book"	
3	Denise Whichhello Brown, "Visual Basic 6 Complete "	

COURSE CODE: ITP44		
COURSE TITLE: Fundamentals of Digital Electronics		
UNITS	CONTENTS	
I	Number System and Codes: Introduction, Number System (Binary Numbers, decimal-binary conversion, OctalNumbers, Octal-Binary Conversions, Hexadecimal Numbers, Hexadecimal-Binary conversions, Hexadecimal-octal conversions), Floating Point Representations of Numbers, Arithmetic Operations (Binary Arithmetic), 1's and 2's Compliment (1's Compliment Subtraction, 2's Compliment Subtraction , Signed Binary number Representations, Addition in the 2's compliment System, Subtraction in the 2's compliment system, Boolean Algebra: Basic Laws of Boolean algebra (Boolean addition, Boolean	

	Multiplication, Properties of Boolean Algebra, Demorgan theorems, Sum of Products and Product of Sums, (Minterm, Maxterm, Deriving Sum of Products(SOP) Expression from Truth Table, Deriving Product of Sum(POS) Expression from Truth Table, Karnaugh Map (Two variable, Three variable).	
II	<p>Logic gates: Logic gates (OR Gate, AND Gate, NOT Gate, NAND Gate, NOR Gate, Ex-OR Gate, Ex-NOR Gate).</p> <p>Arithmetic Circuits: Half Adder, Full Adder, Half-Subtractor, Full Subtractor, Combinational Circuits: Multiplexers, Basic four input multiplexer, Demultiplexers, 1 to 4 demultiplexer, Decoders, Basic Binary decoder, 3 to 8 decoder, Encoders : Decimal to Binary Encoder.</p>	
III	<p>Flip Flops: Introduction, Flip Flops, Types of Flip-Flops, S-R Flip-Flop (NOR Based, NAND Based), Clocked S-R Flip-Flop, D Flip-Flop, J-K Flip-Flop</p> <p>Memories: Introduction, Classification of memories, Registers, Main Memories and Secondary Memory, Sequential Access Memory And Random Access Memory, Static and Dynamic Memory, Volatile and Non Volatile Memory, Magnetic and Semiconductor Memory, Basic Memory Structure</p>	
	SUGGESTED BOOKS	
1	Basic Digital Electronics (Physics and Its Applications)" by J.A. Strong.	
2	Digital Electronics (Basic Skills in Electricity and Electronics)" by Roger L Tokheim	

COURSE CODE: ITP45		
COURSE TITLE: Practical – VB		
UNITS	CONTENTS	
I	UNIT-II,III	
II	UNIT IV, V	
III	UNIT VI,VII	
IV	UNIT IX	

Semester V

COURSE CODE: ITP51		
COURSE TITLE: COMPUTER NETWORKS AND TECHNOLOGY		
UNITS	CONTENTS	
I	Data Communication and System Introduction, Purpose, Source,	

	Transmitter or Sender, Transmission System, Receiver Destination	
II	Evolution of Communication Technologies, Components, Data Transmission, Analog and Digital Data Transmission.	
III	Data and Signal Analog Signaling, Digital Signaling, Frequency Spectrum and Bandwidth..	
IV	Time and FrequencyDomain Concepts, Space-division Multiplexing	
V	Transmission Media, Introduction, Magnetic Media, Twisted-pair Cables, Base band and Broadband Coaxial, Cables, Fiber Optics	
VI	Computer Networks LAN Applications and Benefits, Media Access Control, Centralized Control, Decentralized Control.	
VII	Deterministic Access, Nondeterministic Media Access Control, LAN Hardware, Network Interface Card, LAN Operating systems, Transmission Media.	
VIII	LAN Topologies, Bus Topology, Access Method and Collisions, LocalTalk, Ring Topology, Reliability Mechanisms, Star Topology, ATM for LANs	
IX	Networking Introduction, Networking, Benefits of Networks, Different LAN and WAN Connections, Local Area Networks (LANs), Wide Area Networks (WANs)	
X	Connecting to a Network Setting the Computer Network, Networking Technologies, Connecting your Network to the Internet, Testing Connection, Access Control And Denial Of Service, access Control Overview, Access Control Objectives, Identification and Authentication.	
XI	Access Control Techniques, Passwords, Memory Card, Smart Card, Hand-held Password Generators, Biometrics, Encryption, Token, Encrypted Keys.Access Control Methodologies.	
XII	Discretionary Access Control (DAC) Mandatory Access Control (MAC), Role Based Access Control (RBAC), Access Control Implementation, Security Administration Cost Reductions	
SUGGESTED BOOKS		
1.	Computer Networks (5th Edition) by Andrew S. Tanenbaum and David J. Wetherall.	
2.	Computer Networks by Andrew S. Tanenbaum	
3.	Computer Networking: A Top-Down Approach (5th Edition) by James F. Kurose andKeith W. Ross.	

COURSE CODE: ITP52		
COURSE TITLE: Basic Management Information System		
UNITS	CONTENTS	
I	Systems Concepts, Components of Information, What is an Information System? A Framework for Business Users, Organization as a System, Management, Components of an Information System, Information System Resources, Why Information Systems?, The Competitive Business Environment, Why Business Need Information Technology?, Emergence of the Global Economy, Transformation of the Business Enterprise..	
II	Types of Information Systems, National Level, Company Level, Individual	

	Level Managers and 22 P a g e Information Systems, Role of Information Systems, The Network Revolution and the Internet, New Options for Organizational Design: The Networked Enterprise, Enterprise Resource Planning, Electronic Markets.	
III	Tactical And Strategic Level Information Systems: Nature of Tactical and Strategic Information Systems, Tactical Accounting and Financial Information Systems, Cash Management Systems, Capital Budgeting Systems, Investment Management Systems, Strategic Accounting and Financial Information Systems, Financial Condition Analysis Systems, Long-range Forecasting Systems, Marketing Information Systems, Sales Management Systems, Advertising and Promotion Systems, Pricing Systems, Distribution Channel Systems, Competitive Tracking Systems, Strategic Marketing Information Systems, Sales Forecasting Systems, Marketing Research Systems, Product Planning and Development Systems, Tactical Production Information Systems, Materials Requirements Planning Systems, Just-In-Time Systems, Capacity Planning Systems, Production Scheduling Systems, Product Design and Development Systems, Manufacturing Resource Planning Systems, Computer Integrated Manufacturing Systems, Strategic Production Information Systems, Site Planning and Selection Systems, Technology Planning and Assessment Systems, Process Positioning Systems, Plant Design Systems, Tactical Human Resource Information Systems, Job Analysis and Design Systems, Recruiting Systems, Compensation and Benefits Systems, Succession Planning Systems, Strategic Human Resource Information Systems, Workforce Planning Systems, Information Systems Supporting Labour Negotiations.	
IV	Systems Concepts, System Boundaries, Systems and Sub-systems, Outputs and Inputs, Interface Problems, System and its Environment, System Feedback, System Maintenance, System Stress and Change, Systems Concepts in Business, Information System as a Sub-system, Operational Systems, Outputs and Inputs, System Feedback, Sub-system Interface, Validation Checks, Structure of an Enterprise, Some Basic Concepts and Strategies in the Study of Systems, Classification of Information Systems, Classification by Mode of Data Processing, Classification by System Objectives, Classification based on the Nature of Interaction with Environment.	
V	Components of Information Systems, Formal vs. Informal Specifications, Components of Specifications, Using the Systems Approach in Problem Solving, Define the Problem, Gather Data Describing the Problem, Identify Alternative Solutions, Evaluate the Alternatives, Select and Implement the Best Alternatives, Follow up to Determine whether the Solution is Working.	
VI	Information Systems And Strategy: The Strategy Development Process, Process in Outline, Managing the Process, Information Systems and Business Strategy, Business Level Strategy and the Value Chain Model, Leveraging Technology in the Value Chain, Information System Products and Services, Systems to Focus on Market Niche, Supply Chain Management and Efficient Customer Response Systems, Firm Level Strategy and Information	

	Technology, Industry Level Strategy and Information Systems: Competitive Forces and Network Economics, Information Partnerships, The Competitive Forces Model, Network Economics, Using Systems for Competitive Advantage: Management Issues, Managing Strategic Transitions, What Managers can do.	
VII	Decision Support Systems (Dss), Decision Support Systems (DSS), DSS and MIS, Framework of Decisions Support Systems, Need for an Expanded Framework, An Expanded Framework, Types of DSS, Data-Driven SS Model-Driven DSS, Knowledge-Driven DSS, Document-Driven DSS, Communications-Driven and Group DSS, Inter-Organizational or Intra-Organizational DSS, FunctionSpecific or General Purpose DSS, Components of DSS Overview of a DSS, Examples of DSS Applications, Web-Based DSS, Customer Decision Support on the Internet.	
	SUGGESTED BOOKS	
1	Management Information Systems by Ken Laudon and Jane Laudon	
2	Management Information Systems by James A. O'Brien and George M. Marakas.	

COURSE CODE: ITP53		
COURSE TITLE: RDBMS with MySQL		
UNITS	CONTENTS	
I	Introduction to Databases- Data versus Information, File Oriented Approach, Database Oriented Approach, Characteristics of Database. Database Management System- Characteristics of DBMS, DBMS Architecture, Advantages and Disadvantages of DBMS, Types of Database Systems. Types of Database Models- Record-Based Model, Relational Model, Network Model, Hierarchical Model, E-R Model, Object-Oriented Model.	
II	Introduction. Relational Database Management System- Characteristics of RDBMS, Exploring Tables in Databases, ER Diagrams. Explaining Data Integrity- Entity Integrity, Domain Integrity, Referential Integrity, UserDefined Integrity. Exploring Keys- Primary Key, Foreign Key, Composite key, Candidate Key. Rules of Normalization- First Normal Form, Second Normal Form, Third Normal Form, Fourth Normal Form, Fifth Normal Form. BoyceCodd's 12 Rules	
III	Introduction. Opening the Query Editor Window. Working with SQL Data Statements- Retrieving Data Using the SELECT Statement, Inserting Data Using the INSERT Statement, Modifying Data Using the UPDATE Statement, Deleting Data, Using the DELETE Statement. Working with Operators- Arithmetic Operators, Logical Operators, Comparison Operators, Assignment Operator, Bitwise Operators, String Concatenation Operators, Unary Operators, Compound Assignment Operator. Working with Aggregate Functions.	

IV	Introduction. Data Types- Exact Numerics, Approximate Numerics, Date and Time, Character Strings, nicode Character Strings, Binary Strings, Other Data Types. Database Operations- Creating a Database, Dropping the Database. Table Operations- Creating a Table, Altering the Table, runcating the Table, Dropping the Table. Constraints- The PRIMARY KEY Constraint, The UNIQUE Constraint, The FOREIGN KEY Constraint, The CHECK Constraint. Joins- Performing a Cross Join, Performing an Inner Join, Performing an Outer Join, Performing a Self-Join.	
V	Introduction. Introducing Triggers. Triggers Vs Constraints. DML Triggers- Creating DML Triggers, Using DML Trigger. DDL Triggers- Creating DDL Triggers, Using DDL Triggers. DML Triggers Vs DDL Triggers..	
VI	Introduction. Introducing ACID Properties. Classifying Transactions- Explaining Explicit Transactions, Defining Auto commit Transactions. Creating Transactions. Saving Transactions. Understanding Locking. Discussing Concurrency- Describing Optimistic Concurrency, Describing Pessimistic Concurrency, Discussing Concurrency Problems. Outlining Isolation Levels. Locking in SQL Server 2008 R2- Categorizing the Different Lock Modes, Managing Deadlock. Implementing Error Handling- Using the @@ERROR Function, Using the RAISERROR Statement, Using the TRY...CATCH Statement.	
	SUGGESTED BOOKS	
1	Beginning Relational Data Modeling (Paperback) ...	
2	MySQL: The Complete Reference (Paperback).	

COURSE CODE: ITP54A		
COURSE TITLE: Microprocessor		
UNITS	CONTENTS	
I	Evolution of Microprocessor, Internal microprocessor (8086 to Pentium) architecture of 8086; Programming Model, Real mode memory addressing, Introduction to protected mode memory addressing memory paging. Addressing modes: Data, program, Stack, memory-addressing modes	
II	Instruction set of 8086, Assembly language programming for 8086 microprocessor, Memory Segmentation.	
III	16 and 32 – bit memory interfacing, various bus protocols like ISA, EISA, VESA, PCI. Architecture Coprocessor (8087), programming with 8087, Multi-Processor System, Introduction to MMX technology.	
IV	Introduction to Pentium and its higher generations: architecture, memory management. Assembler, debugger, Introduction to bit Slice processor, Signal processing processor and transputers, Introduction to development tools, MDS , logic analyzer , in-circuit emulator.	
	SUGGESTED BOOKS	
1	Uffenback, “The 8086 Family Design” PHI, 2nd Edition.	
2	Lice & Gibson, “Microcomputer System 8086 / 8088” PHI, 2nd Edition.	

COURSE CODE: ITP54B

COURSE TITLE: Cyber Security

UNITS	CONTENTS	
I	Information Security concepts Information Security Overview, Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks	
II	Security Threats and Vulnerabilities Overview of Security threats, Password Cracking, Insecure Network connections, cyber-crime, Intruders, Viruses and related threats	
III	Encryption Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC	
IV	Cryptography Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory	
V	System Security Desktop Security, email security: PGP and SMIME, Web Security: web authentication, SSL and SET, Database Security	
VI	Wireless Security IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management. Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure.	
VII	Security Laws and Standards Security Assurance, Security Laws, IPR, International Standards, Security Audit, SSE- CMM, etc.	
SUGGESTED BOOKS		
1	Fundamentals of Network Security by Eric Maiwald (Dreamtech press) Perlman and Mike Speciner, Pearson/PHI.	
2	Network Security - Private Communication in a Public World by Charlie Kaufman, Radia	

COURSE CODE: ITP55A		
COURSE TITLE: MySQL lab		
UNITS	CONTENTS	
I	Starting MySQL, Building a Database	
II	Create tables with different datatypes	
III	Use various command to perform certain operations such as Insertion , Selection, Modification, Deletions etc.	

COURSE CODE: ITP55B		
COURSE TITLE: MIS lab		
UNITS	Study Of Physical and conceptual Structure of MIS	
I	ERP and its Applications	
II	Study of Decision Support System and its user and Characteristics	
III		

Semester VI

COURSE CODE: ITP61		
COURSE TITLE: Seminar and Report		

COURSE CODE: ITP62		
COURSE TITLE: DTP		
UNITS	CONTENTS	
I	<p>CorelDraw Basics : Introduction; CorelDraw Terminology; Starting CorelDraw 10; CorelDraw Interface; Title Bar; Menu Bar; Tool Box; Drawing Window; Drawing Page; Property Bar; Flyouts; Standard Toolbar; Controlling the display of Toolbars; Working with Docker Windows; The Status Bar; CorelDraw View; Zooming and Planning.</p> <p>Basic Drawing : Introduction; Working with Lines; Drawing a Curve; Bezier Lines and Curves; Rectangles and Squares; Ellipses and Circles; Polygons and Stars; Selection Techniques; Using Rulers; Using Grids and Guidelines; Defining Grids; Snap to Grid; Defining Guidelines; Snap to Guidelines; Spirals and Graphs; Spirals; Graphs</p> <p>The Artistic Media Tool : Introduction; Using Preset Tool; Using Brush Tool; Using Object Sprayer Tool; Using Calligraphic Tool; Pressure-Sensitive Lines or Curves; Applying Artistic Media Effects.</p> <p>Advanced Drawing : Introduction; Grouping and Ungrouping Objects; Working with Layers; Object Locking; Editing Curves with nodes; Editing Shapes and Nodes; Using Knife Tool; Using the Eraser Tool; Using Free Transform Tool.</p>	
II	Working with Text : Creating Artistic Text in Paragraphs; When to use	

	<p>Artistic Text?; Working with Artistic Text; Creating Artistic Text; When to use Paragraph Text?; Creating Paragraph Text; Switching between Artistic and Paragraph Text; The Text Property Bar; Formatting Text; Format Text Dialog Box; Character Formatting; Paragraph Formatting; Setting Tabs; Setting Columns; Using Effects; Using Edit Text Feature; Using Find and Replace; Change Case; Using Spell-Check; Grammar Checking Text; Using Thesaurus.</p> <p>Advanced Text Work: Fitting Text to Path; Flowing Text around an Object; Flowing Text within an Object; Editing individual Characters; Kerning Individual Characters; Working with Text Styles; Linking Frames. The Outline Tool : Introduction; Using the Outline Pen Dialog Box; Setting Outline; Outline Styles; Outline Color; Outline Corners; Setting Outline Arrows; Applying Calligraphic Outlines; Setting Outline Options with the Property Bar; Behind Fill Option; Scale with Image Option; Outline Color Dialog Tool; Color Model; Color Harmonies; Color Blend; Setting Outline Defaults. The Fill Tool : Introduction; Using Uniform Fills; Using Fountain Fills; Using Texture Fills; Using PostScript Fills; Using Pattern Fills; Using Mesh Fills; Using Interactive Fills; Copying Fills; Setting Fill Defaults. The Interactive Tools : Introduction; Distorting Objects; Push and Pull Distortion; Zipper Distortion; Twister Distortion; Extruding Objects; Blending Objects; Interactive Envelopes; Free Transformations; Applying Interactive Shadow; Applying Interactive Transparency; Applying Interactive Contours.</p>	
III	<p>Working with Images: Introduction; Image Formats; Importing Images; Using the Scrapbook; Bitmap Images; Cropping Bitmaps; Bitmap Special Effects; Color Masking; Resizing & Rotating/Skewing Images; Exporting Images. Page Layout : Introduction; Layout Styles; Define Page Size; Setting the Size; Inserting Pages; Specifying Background Color; Hiding the Page Border; Going to specific Pages. Printing and Publishing : Introduction; Selecting a Printer; Using Layout Styles when Printing; Tiling a Print Job; Using Print Style; Print to File.</p>	
IV	<p>Text, Layers and Masks in Photoshop Adding Text to Images; Layer Effect; Glows Effect; Bevel and Emboss; Using Layers and Masks; Layers; Creating a New Layer; Hiding and Showing of Layers; Working with Multiple Layers; Merging Layers; Layer Effects; Masks; Quick Mask; Adding Mask to the Layer; Editing Layer Masks; Removing Layer Mask Special Effects in Photoshop Applying a Radial Blur; Adding Noise Texture; Creating Halftone Pattern; Blending Modes; Applying Ripple Effect; Creating Lightening Effects Menu Commands of Photoshop Introduction; File Menu; Edit Menu; Image Menu; Layer Menu; Select Menu; Filter Menu; View Menu; Window Menu; Help Menu.</p> <p>Keyboard Shortcuts of Photoshop Viewing; Selecting and Moving Objects; Painting; Editing; Path editing; Slicing and Optimizing</p>	
	SUGGESTED BOOKS	
1	“Operating Systems: A Concept-Based Approach” by D. M. Dhamdhare	

COURSE CODE: ITP63

COURSE TITLE: COMPUTER GRAPHICS USING C	
UNITS	CONTENTS
I	Overview of Computer Graphics Introduction, Computer Graphics System, Interactive Graphics, Passive Graphics, Application of Computer Graphics
II	Display Devices Introduction, Display Devices, Cathode Ray Tube ,Bit Mapped Graphics, Graphics Attributes, Refresh Cathode Ray Tubes, Random Scan Displays, Raster-Scan Displays
III	Color CRT Monitors Direct-View Storage Tubes (DVST), Plasma Panel Displays, Thin Film Electroluminescent displays
IV	Light Emitting Diode (LED) Liquid Crystal Displays (LCDs), Hard Copy Output Devices
V	Transformations 2D translation, scaling, rotation, and shear, Windowing transformations , Instance Transformations, Structured graphics, 3D, translation, scaling, rotation 2-D Graphics Introduction, Scan Conversion, Digital Differential Analyzer, Bresenham's Algorithm, Integer Bresenham's Algorithm, General Bresenham's Algorithm, Circle Generation Algorithms Bresenham's circle generation algorithm, Midpoint Circle Algorithm , Ellipse Generation algorithms, Midpoint Ellipse Algorithm Arc Generation algorithms, Fill Algorithms, Fundamentals of Antialiasing, Dithering
VI	Graphics Transformations Geometric and Coordinate Transformations, Transformation Composition View and Clipping Exterior and Interior Clipping, Viewport Transformation, Polygon Clipping, Text Clipping
VII	3-D Graphics Introduction, 3-D Graphics Transformations, Coordinate Transformations Projections Perspective Projection on a Plane with C (0,0,0), Perspective Projection on a Plane with C(a,b,c), Parallel Projections
	SUGGESTED BOOKS
1	Fundamentals of Computer Graphics by Peter Shirley, Michael Ashikhmin and Steve Marschner.
2	Fundamentals of Computer Graphics: Proceedings of the Second Pacific Conference on Computer Graphics and Applications, Pacific Graphics 94, Beijing, by Jiannan Chen.

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