Department Of Information Technology

Semester 1:

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2021-2022

Diploma in Electrical Engineering : Regular (Grant-in aid)

Year	I	**Core/~~Elective~~/~~Foundation~~** **Subject Name: COMMUNICATION SKILL-I**	Lecture Hrs per week	2
Semester	I		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hrs
Unit-1	**Strengthening Grammar** Articles, Prepositions, Verbs, Tenses, Adjectives, Concord, Error Analysis	07
Unit-2	**Developing Reading Skills** Reading Comprehension: Developing Vocabulary through Derivation, Conversion and Compounding. From a seen/unseen passage write single and multiple sentence answers	08
Unit-3	**Developing Writing Skills** Paragraph Writing: Sentence linkers and supporting sentences. Identification and organization of paragraph types. Guided compositions. Writing Letters and Report. Technical report: Reporting workshop jobs- Carpentry, Fitting, Smithy, Tin Smithy Letter Writing: Letter seeking Permission and Request letter, Letter of Inquiry	10
Unit-4	**Consolidating Speaking Skills** Dialogue Rendering and Writing**:** Greeting and taking leave**,** Introducing self and others Congratulating and Inviting**.** Expressing sympathy and offering condolences	05

REFERENCES

1.	Moghe, Rakhi et.al. Developing English Language Skills. Ahmedabad: Gujarat Technical Publishers.2016.
2.	Das, Bikram K. Functional Grammar and Spoken and written Communication in English—ELT —A student-friendly edition. Kolkata: Orient Blackswan. 2008
3.	Rajeevankaral. Oxford English grammar just for you. Oxford.2014
4.	Achar, Deeptha.Barrett, Rajan Dash, Santosh Jain, Charul. Ketkar, Sachin. Mujumdar, Aarti. English for Academic Purposes Book I Gujarat: University Granth Nirmaan

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2021-2022

Diploma in Information Technology : Regular (Grant-in aid)

Year	I	**Core/~~Elective~~/~~Foundation~~** **Subject Name : APPLIED MATHEMATICS-I**	Lecture Hrs per week	4
Semester	I		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hrs.
Unit-1	**Reorientation:** Surds: Definition, operations and rationalization. Logarithms: Change of base rule and examples.Binomial Theorem : (for integral power)	
Unit-2	**Complex Numbers:** Definitions, Operations, Properties Cartesian & polar forms, De Mover's theorem and its applications, Nature of roots of quadratic equations.	
Unit-3	**Determinants:** Expansion of second and third order determinants, properties, solution of Simultaneous linear equations in two and three unknowns. Matrices: Definitions and operations, Transpose, adjoin and inverse of a matrix, solution of simultaneous linear equations in two and three unknowns.	
Unit-4	**Points (two dimensions):** Distance formula, Section formula, Area of a triangle, Locus of a point. Straight line : Inclination and slope of a line, Different forms of equations to a St. line (i) slope intercept form, (ii) point - slope form (iii) two points form (iv) intercept form, General equation of a straight line, Family of lines, Conditions for concurrency of lines.	
Unit-5	**Circle:** Definition, Equation of a circle with given center and radius, General form of equation of a circle, Equation of a circle when intercepts are given, Circle passing through three points, Equation of a chord, Equations of tangent and normal at a point on a circle.	
Unit-6	**Reorientation:** (Trigonometric functions as circular functions). Addition and factor formulae, Trigonometric functions of multiple and submultiples angles, Inverse trigonometric functions, Trigonometric equations, Properties of a triangle.	

REFERENCES

1.	Theory and Problems in Mathematics, Part 1 and 2 by Dr. R.K. Patel
2.	Mathematics for Polytechnic students. by S.P. Deshpande
3.	Mathematics for Polytechnic students by B.M. Patel
4.	Engineering Mathematics by G.V. Kumbhojkar
5.	XIth&XIIth std. Higher secondary School books for Maths of Gujarat Board.

Semester 2:

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2021-2022

Diploma in Information Technology : Regular (Grant-in aid)

Year	I	**Core/~~Elective/Foundation~~** **Subject Name: APPLIED MATHEMATICS-II**	Lecture Hrs per week	4
Semester	II		Max	100

			marks	

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	Limits, continuity (functions of one variable) Definitions of derivative, differentiation of standard function by first principles.	
Unit-2	Rules of differentiation, Differentiation of algebraic, trigonometric, Inverse trigonometric, exponential, Logarithmic, Implicit functions and composite functions, Higher order derivatives.	
Unit-3	Applications of the derivative : Geometrical interpretation of the derivative, tangents and normals, Angle between two curves, Sub tangent and subnormal, Rectilinear motion, Approximation, Maxima and Minima, Radius of curvature.	
Unit-4	Indefinite integrals : Standard formulae, integration by substitution integration of algebraic functions , integration by the method of partial fractions.	
Unit-5	Integration by parts, Trigonometric substitutions, Definite Integrants, Definition, Definite Integrals as the limit of a sum, properties of definite Integrals.	
Unit-6	Reduction Formulae, Applications of integration: Area, Volume Approximate integrations, trapezoidal rule, Simpson's rule.	

REFERENCES

1.	Mathematics for Polytechnic students. by S.P. Deshpande.
2.	Mathematics for Polytechnic students by B.M. Patel
3.	Engineering Mathematics by G.V. Kumbhojkar
4.	XIth&XIIth std. Higher secondary School books for Maths of Gujarat Board.

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2021-2022

Diploma in Information Technology : Regular (Grant-in aid)

Year	I	**Core/~~Elective~~/~~Foundation~~** **Subject Name : COMMUNICATION SKILLS-II**	Lecture Hrs per week	2
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Weightage(%)
Unit-1	**Grammar: Subject – Verb agreement:** Basic Sentence Patterns. Tenses Reported Speech **.**The Passive Prepositions, Determinants, Modifiers etc.	10
Unit-2	**Composition:** Paragraph writing, Letter writing	10
Unit-3	Comprehension	10

REFERENCES

1.	A remedial Course in English for colleges Book I

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology		ACADEMIC YEAR 2021-2022	
Diploma in Information Technology : Regular (Grant-in aid)				
Year	I	**Core/~~Elective/Foundation~~** **Subject Name: ANALOG AND DIGITAL ELECTRONICS**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

		Hours
Unit-1	**Materials** Conductors Insulators Semiconductors	07 hrs
Unit-2	**Components** Registers Inductors Capacitors Cables Switches and relays PCB	07 hrs
Unit-3	**Electronic Devices** Diode Transistors Thyristor	04 hrs
Unit-4	**Number System** Decimal, Binary, octal, hex, BCD code, grey code, ASCII code, EBCDIC Code Arithmetic operations	05 hrs
Unit-5	**Logic Gates** Positive And Negative Logic Systems - Logic Gates, Symbols And Truth Tables - Universal Gates - NAND And NOR	04 hrs
Unit-6	**Logic Families** Introduction To Digital Logic Family Such As RTL, DTL, TTL, ECL, CMOS Etc. - Comparative Study, Basic Circuit, Performance Characteristics	06 hrs
Unit-7	**Combinational Logic Circuits** Arithmetic Circuits: Half Adder, Full Adder, Parallel Binary Adder, 2's Complement Subtractor, Parallel Binary Subtractor - Multiplexer/De-Multiplexer, Encoder/Decoder, Comparator, Parity Generators & Checkers	06 hrs
Unit-8	**Sequential Logic Circuits**	06 hrs

	Flip-Flop (FF) Circuits: R-S, D, T, J-K And Master Slave J-K - Serial/Parallel Left/Right/Bi-Directional Shift Registers - Asynchronous/Synchronous Up/Down Counters	
Unit-9	**Memories** Memory Classification - RAM: Static And Dynamic - ROM: ROM, PROM, EPROM, EEPROM, Flash	04 hrs
Unit-10	**Digital To Analog And Analog To Digital Conversion** D To A Conversion: Weighted Resistor Network Type, Binary Ladder Network Type - A To D Conversion: Parallel Comparator (Flash) Type, Counter OR Staircase Type, Successive Approximation Type	07 hrs

REFERENCES

1	Principle of electronics by V.K. Mehta
2	Principle of electronics by B.L.Theraja
3	Electronic Devices & Circuits By J. B. Gupta, S. K. Publication
4	Integrated Electronics By Millman & Halkias, Tata McGraw-Hill Education
5	Digital Fundamentals By Thomas L. Floyd, Prentice Hall
6	Digital Design By Morris Mano, Prentice Hall
7	Modern digital electronics by R.P.Jain

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	I	**Core/~~Elective/Foundation~~** **Subject Name: BASICS OF IT**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Introduction To Computers** Characteristics of computer Evolution of Computer Block Diagram Of a computer Generations of Computer Classification Of Computers Applications of Computer Capabilities and limitations of computer	08 hrs

Unit-2	**Basic Computer Organization** Role of I/O devices in a computer system. Input Units Output Units	04 hrs
Unit-3	**Storage Fundamentals** Introduction to Storage Primary storage Secondary Storage Data Storage & Retrieval methods	06 hrs
Unit-4	**Information Technology Basics** Introduction Need for Information Storage and Processing Information Technology Components Role of Information Technology Information Technology and the Internet	06 hrs
Unit-5	**Software** Software and its needs Types of S/W. System Software Application S/W Software Installing and Uninstalling Booting Software Development Steps	08 hrs
Unit-6	**Operating System** Functions Measuring System Performance Assemblers, Compilers and Interpreters Types of Operating system	05 hrs
Unit-6	**Data Communication** Communication Process Data Transmission speed Communication Types (modes) Data Transmission Media Modem Types of Networks LAN Topologies Computer Protocols	05 hrs
Unit-7	**Business Data Processing** Introduction Data storage hierarchy Method of organizing data File Types File Organization File Utilities	06 hrs
Unit-8	**MS Office Tools** Introduction Introduction to Office Packages MS Word MS PowerPoint MS Excel	08 hrs

	MS Access	

REFERENCES	
1	Fundamentals of Information Technology, Wiley India
2	Computer Fundamentals by P.K.Sinha
3	Computer fundamentals by Anita Goel
4	Fundamentals of computers by Rajaraman v. and Adabala N
5	Microsoft Office 2019 Step by Step, Microsoft by Joan Lambert,Curtis Frye

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	I	**Core/~~Elective/Foundation~~** **Subject Name: STRUCTURED PROGRAMMING**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Introduction** What is Structured Programming - History of C - Importance of C - Basic Structure of C program - Programming Style - Executing a 'C' Program - Unix System - MS-Dos System	04 hrs
Unit-2	**Constants, Variables and Data Types** Character Set - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types - Declaration of Variables - Declaration of Storage Class - Assigning Values to Variables - Defining Symbolic Constants - Declaring a Variable as Constant - Declaring a Variable as Volatile - Overflow and Underflow of Data	04 hrs
Unit-3	**Operators and Expressions** Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators - Increment and Decrement Operators - Conditional Operator - Bitwise Operator - Special Operator - Arithmetic Expressions - Evaluation of Expressions - Precedence of Arithmetic Operators - Type Conversions in Expressions - Operator Precedence and Associativity - Mathematical Function	05 hrs
Unit-4	**Managing Input and Output Operations** Reading a Character - Writing a Character - Formatted Input - Formatted output	04 hrs
Unit-5	**Decision Making, Branching and Looping** Decision Making with IF Statement - Simple IF Statement - The IF……ELSE Statement - Nesting of IF……ELSE Statement - The Switch Statement - The ?: Operator - The GOTO Statement- The While Statement - The do Statement - The For Statement - Jumps in Loops	06 hrs
Unit-6	**Arrays**	06 hrs

	One – Dimensional Arrays, Declaration of One – Dimensional Arrays, Initialization of One – Dimensional Arrays, Two – Dimensional Arrays, Initializing Two Dimensional Arrays, Multi – Dimensional Arrays, Dynamic Arrays	
Unit-7	**Character Array and Strings** Declaration and Initializing String Variables - Reading String from Terminal - Writing String to Screen - Arithmetic Operations on Characters - Putting Strings Together - Comparison of Two String - String Handling Functions - Table of Strings	05 hrs
Unit-8	**User Defined Functions** Need for User-defined Functions - A Multi-Function Program - Elements of User-Defined - Functions - Definition of Functions - Return Values and their Types - Function Calls - Function Declaration - Category of Functions - No Arguments and No Return values - Arguments but No Return values - Arguments with Return values - Functions that Return Multiple values - Nesting of Functions - Recursion - Passing Arrays to Functions - Passing Strings to Functions - The Scope - Visibility and Lifetime of Variables	06 hrs
Unit-9	**Structures and Unions** Defining a Structure - Declaring Structure Variables - Accessing Structure Members - Structure Initialization - Copying and Comparing Structure Variable - Operations on individual Members - Arrays of Structures - Arrays within Structures - Structures within Structures - Unions - Size of Structures - Bit Field	06 hrs
Unit-10	**Pointers** Understanding Pointers - Accessing the Address of Variable - Declaring Pointer Variable - Initialization of Pointer Variables - Accessing a Variable through its Pointer - Chain of Pointers - Pointer Expression - Pointer Increment and Scale Factor - Pointers and Arrays Pointers and Character Strings - Array of Pointers - Pointers as Function Arguments - Functions Returning Pointers - Pointers to Functions - Pointers and Structures	06 hrs
Unit-11	**File Management in C** Defining and Opening a File - Closing a File - Input/output Operations on File - Error Handling during I/O Operations - Random Access to Files - Command Line Argument	04 hrs

REFERENCES

1	Programming in ANSI C By E Balagurusamy, Tata McGraw Hill
2	The C Programming Language By Brain W. Karnighan & Dennis M. Ritchie, PHI Publication
3	Let Us C By Yashvant Kanetkar, BPB Publication
4	Programming in C By Pradip Dey, Oxford Higher Education
5	Programming in C By Stephen Kochan, SAMS Publishers

Semester 3:

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)		

Year	II	**Core/~~Elective/Foundation~~** **Subject Name : MANAGEMENT INFORMATION SYSTEM**	Lecture Hrs per week	4
Semester	I		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Introduction to MIS :** Management activities, roles and levels, Management Planning and Control, Strategic Planning within an organization: activities, techniques and results. The nature of decision-making: decision-making models and classification of decision-making situations, The nature of information: classifications and characteristics. MIS sub types, Measurement of MIS performance and capabilities.	12
Unit-2	**MIS applications and relationships :** Types of Information Systems: Transaction Processing System(TPS) – Office Automation System (OAS) – Management Information System (MIS) – Decision Support System (DSS) and Group Decision Support System (GDSS) – Expert System (ES) –Executive Support System (ESS)- Digital Dashboards, Artificial Intelligence and Machine Learning, Data warehouses and data mining facilities: the relationship between data warehousing and other MIS facilities.	12
Unit-3	**Introduction to ERP :** Various Functional Modules, Application of ERP with respect to Supply Chain Management, Customer Relationship Management, Financial Management, Human Resource Management, Business Intelligence	10
Unit-4	**Ethical Issues pertaining to IS :** Ethical responsibilities of business professionals, Computer crime – hacking & cracking, cyber theft, unauthorized use at work, software piracy, theft of intellectual property, viruses & worms, adware and spyware	10
Unit-5	**Information Security :** First line of defense – People / employees, Second line of defense – Technology for authorization, prevention, detection and response, Contemporary/ emerging technologies: Cloud and mobile computing, E-commerce, m-commerce, Internet of Things	12

REFERENCES

1.	Essentials of Management Information Systems, Kenneth Laudon, Jane Laudon, Prentice Hall
2.	Management Information Systems - Managing the digital firm, Laudon K.C, Laudon J.P, Brabston M.E, Pearon Education, 2004
3.	Decision Support Systems and Intelligent Systems, Turban and Aronson, Pearson Education Asia
4.	Introduction to Information Technology, Turban E.F, Potter R.E, Wiley, 2004.

Diploma in Information Technology : Regular (Grant-in aid)				
Year	II	**Core/~~Elective/Foundation~~** **Subject Name : DATA STRUCTURE**	Lecture Hrs per week	4
Semester	I		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Introduction To Data Structures :** Classification Of Data Structure - Memory Allocation In C - Algorithms & Its Key Features - Data Structures Operations - Abstract Data Types.	08
Unit-2	**Array :** One Dimensional Array: Accessing One Dimensional Array Elements, Implementation Of One–Dimensional Array In Memory - Passing Array To Function - Insertion In One –Dimensional Array - Deletion Of An Element From One–Dimensional Array - Traversing Of An Array - Merging Of Two Array - Row Major Arrays - Column Major Arrays.	08
Unit-3	**Strings :** Character String - Two String Storage Schemes - Library Functions For String Manipulation - Array Of Strings - Passing Strings To Function - String Matching - Concatenation - Reversing - Appending - Comparing - Copying A String.	08
Unit-4	**Stacks & Queues :** Stack Implementation: Push And Pop Operations On Stack - Implementing Stack Using Pointers - Applications Of Stacks - Infix, Prefix And Postfix Form Of Expressions And Its Conversions - Implementation Of Queue: Algorithms For Insertion And Deletion In Queue (Using Arrays) - Algorithm For Insertion And Deletion In A Queue (Using Pointers) - Priority Queues - A Circular Queue - Addition And Deletion In A Circular Queue (Using Arrays) - Application Of Queues	08
Unit-5	**Linked Lists :** Advantages & Disadvantages Of Linked List And Comparison With Arrays - Representation Of Linear Linked List - Operations On Linked List - Types Of Linked List : Singly, Doubly And Circular Linked Lists And Its Operations - Application: Addition Of Two Polynomials	09
Unit-6	**Trees :** Binary Trees And Its Types - Basic Terms: Level Number, Degree, In-Degree And Out-Degree, Leaf Nodes, Internal Nodes, Path, Height Of Tree, Depth Of Tree, Directed Edge, Binary Tree Representation - Operations On Binary Trees - Technique Of Converting An Expression To Binary Tree, Binary Search Trees And Its Traversal Orders: Preorder, Post-Order And In-Order Traversing - Threaded Binary Trees - Height Balanced Trees - Extended Binary	08
Unit-7	**Sorting & Hashing :** Bubble Sort - Selection Sort - Insertion Sort - Quick Sort - Bucket Or Radix Sort - Merge Sort - Heap Sort - Shell Sort - Linear Searching - Binary Searching - Hashing - Bucket Overflow - Advantages Of Chaining	07

REFERENCES	
1.	Data Structure through 'C' By G.S Baluja, Dhanpat Rai and Co.
2.	Data and Fila Structure By Bhakti raul – Palkar, Techmax Publication
3.	Data Structures through C By Yashavant P. Kanetkar., BPB Publication
4.	Data Structures using C/C++ By Mark Allen Weiss, Benjamin Cummings Publication
5.	Data Structures and Algorithms By Thomas Cormen, Made Easy Publication

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology		ACADEMIC YEAR 2021-2022	
Diploma in Information Technology : Regular (Grant-in aid)				
Year	II	**Core/~~Elective/Foundation~~** **Subject Name : COMPUTER ORGANIZATION AND ARCHITECTURE**	Lecture Hrs per week	4
Semester	I		Max marks	100
COURSE CONTENT / SYLLABUS				
PROPOSED SYLLABUS				
				Hours
Unit-1	**Introduction To Computer Systems :** Historical Background - Architectural Development And Styles: Von Neumann Architecture And Its Features, Harward Architecture And Its Features - Technological Development - Performance Measures			08
Unit-2	**Instruction Set Architecture And Design :** Memory Locations And Operations - Addressing Modes - Instruction Types - Programming Examples - Assembly Language			08
Unit-3	**Computer Arithmetic :** Number Systems - Integer Arithmetic - Floating-Point Arithmetic			08
Unit-4	**Processing Unit Design :** CPU Basics - Arithmetic Logic Unit - Register Set - Data Path - CPU Instruction Cycle - Control Unit			08
Unit-5	**Memory:** Concept Of Primary And Secondary Memory - Memory Hierarchy - Main Memory - Cache Memory - Associative Memory (CAM) - Virtual Memory Concept - Memory Management Unit			09
Unit-6	**IO Devices :** Peripheral Devices - I/O Processors - DMA - Interrupt Handling - Data Communication			08
Unit-7	**Introduction To Parallel Processing :** Flynn's Classification - Pipelining - Vector Processor - Parallel Processors - RISC V/S CISC			07
REFERENCES				
1.	Data Structure through 'C' By G.S Baluja, Dhanpat Rai and Co.			

2.	Data and Fila Structure By Bhakti raul – Palkar, Techmax Publication
3.	Data Structures through C By Yashavant P. Kanetkar., BPB Publication
4.	Data Structures using C/C++ By Mark Allen Weiss, Benjamin Cummings Publication
5.	Data Structures and Algorithms By Thomas Cormen, Made Easy Publication

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology		ACADEMIC YEAR 2021-2022	
Diploma in Information Technology : Regular (Grant-in aid)				
Year	II	**Core/~~Elective/Foundation~~** **Subject Name : FUNDAMENTALS OF WEB PROGRAMMING**	Lecture Hrs per week	4
Semester	I		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Introduction to HTML :** Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, Browser architecture and Web site structure, Overview and features of HTML5, Graphics tags, Media Tags, HTML API's.	12
Unit-2	**Style Sheets, User Experience Design:** Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, Overview and features of CSS3, CSS and Layouts, Responsive Webpage design, Work Flow for designing a web site User Experience Principles, Design Principles.	14
Unit-3	**XML :** Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX, XSLT,DTD, XML Schema, XML Parsers.	15
Unit-4	**JAVASCRIPT and AJAX:** Introduction, HTTP request AND HTTP Methods, JavaScript, JavaScript Events, DOM, JQuery, using and Integrating JavaScript Functionality, JQuery widgets, XMHttpRequest, Introduction to AJAX, Implementing AJAX in Web Pages, JSON	15

REFERENCES

1.	Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2.	HTML 5, Black Book, dreamtech Press.
3.	Developing Web Applications in PHP and AJAX, Harwani, McGrawHill.
4.	Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson.
5.	Web Technologies by Atul Kahate and Achyut Godbole, Tata McGraw Hill.

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2022-2023

Diploma in Information Technology : Regular (Grant-in aid)

Year	II	**Core/~~Elective/Foundation~~** **Subject Name : OBJECT ORIENTED PROGRAMMING WITH C++**	Lecture Hrs per week	4
Semester	I		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Overview of Object Oriented Modeling and Design :** Concept Of Object Oriented Modeling - Object Oriented Methodology	04
Unit-2	**Introduction to Object Oriented Modeling Techniques :** Object Modeling: Objects And Classes - Dynamic Modeling - Functional Modeling - Relationship Among Models	04
Unit-3	**Principles of Object-Oriented Programming :** Basic Concepts Of Object-Oriented Programming - Procedural Vs Object Oriented Programming - Principles of OOP - Benefits Of OOP - Applications Of OOP	04
Unit-4	**C++ Basics :** Structure Of C++ Program - Tokens - Data Types: User-Defined Data Types, Built -In Types, Derived Data Types - Type Compatibility - Variables - Operators In C++: Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators, Manipulators, Type Cast Operator - Expressions And Implicit Conversion - Operator Precedence - Control Structures	06
Unit-5	**Functions in C++ :** Function Prototyping - Call By Reference - Return By Reference - Inline Functions - Default Arguments - Const Arguments - Function Overloading - Friend And Virtual Functions	05
Unit-6	**Classes and Objects :** Basics Of Classes And Objects - Specifying A Class: Defining Member Function, Making An Outside Function Inline, Nesting Of Member Function, Private Member Function - Arrays Within A Class - Memory Allocation For Objects - Static Data Members And Static Member Functions - Arrays Of Objects - Objects As Function Arguments - Friendly Functions - Const Member Functions - Pointers To Members	06
Unit-7	**Constructors and Destructors :** Constructors - Parameterized Constructors - Multiple Constructors In A Class - Constructors With Default Arguments - Dynamic Initialization Of Objects - Copy Constructor - Dynamic Constructor - Constructing Two Dimensional	05

	Arrays - Const Objects – Destructors	
Unit-8	**Operator Overloading and Type Conversion :** Defining Operator Overloading - Overloading Unary Operators - Overloading Binary Operators - Overloading Binary Operators Using Friends - Rules For Overloading Operators - Type Conversions	04
Unit-9	**Inheritance :** Defining Derived Classes - Single Inheritance - Making Private Member Inheritable - Multilevel Inheritance - Multiple Inheritances - Hierarchical Inheritance - Hybrid Inheritance - Virtual Base Classes - Abstract Classes - Constructors In Derived Classes - Member Classes: Nesting Of Classes	05
Unit-10	**Pointers, Virtual functions and Polymorphism :** Concept Of Pointers - Pointers To Objects - This Pointer - Implementing Polymorphism	04
Unit-11	**Managing Console I/O Operations :** C++ Streams And Stream Classes - Unformatted I/O Operations - Formatted Console I/O Operations - Managing Output With Manipulators	04
Unit-12	**Working with Files :** Classes For File Stream Operations - Opening And Closing A File - File Pointers And Their Manipulators - Sequential Input And Output Operations - Updating A File: Random Access - Error Handling During File Operations - Command-Line-Arguments	05

REFERENCES

1.	Object Oriented Programming With C++ By E Balagurusamy, TMH
2.	C++ Programming, Black Book By Steven Holzner, Dreamtech
3.	Object Oriented Design By Rambaugh, Pearson Publication
4.	Object Oriented Programming in Turbo C++ By Robert Lafore, Galgotia
5.	Object Oriented Programming with ANSI and Turbo C++ By Ashok Kamthane, Pearson
6.	The Compete Reference C++ By Herbert Schlitz, TMH
7.	Object oriented Programming with C++, Jesse Liberty & keugh, PHI

Semester 4:

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology		ACADEMIC YEAR 2021-2022	
Diploma in Information Technology : Regular (Grant-in aid)				
Year	II	**Core/~~Elective/Foundation~~** **Subject Name : JAVA PROGRAMMING**	Lecture Hrs per week	4
Semester	II		Max marks	100
COURSE CONTENT / SYLLABUS				
PROPOSED SYLLABUS				

		Hours
Unit-1	**Introduction To The History And Evolution Of Java** Java's Lineage - The Creation Of Java - Java And The Internet: Java Applets, Security, Portability, Java's Magic: The Bytecode, Servlets - The Java Buzzwords: Simple, Object-Oriented, Robust, Multithreaded, Architecture-Neutral, Interpreted And High Performance, Distributed, Dynamic - The Evolution Of Java - An Overview Of Java: Overview Object-Oriented Programming, Abstraction, The Three OOP Principles	06
Unit-2	**Data Types, Variables, Arrays & Operators** The Simple Data Types - Literals - Variables: Declaring A Variable, Dynamic Initialization, The Scope And Lifetime Of Variables - Type Conversion And Casting: Java Automatic Conversions, Casting Incompatible Type, Automatic Type Promotions In Expressions - Arrays: One Dimensional Arrays, Multidimensional Arrays, Alternative Array Declaration Syntax - Operators: Arithmetic Operator, The Bitwise Operator, Relational Operator, Boolean Logical Operator, The Assignment Operator, The ? Operator - Operator Precedence: Using Parenthesis	07
Unit-3	**Control Statements** Java's Selection Statements: If Statement & Switch - Iteration Statements: While, Do-While, For, The For-Each Version Of The For Loop, Nested Loops - Jump Statements: Using Break, Using Continue & Return	06
Unit-4	**Introducing Classes & Methods** Class Fundamentals: Declaring Objects, Introducing Methods - Constructors: Parameterized Constructors - The This Keyword: Instance Variable Hiding - Garbage Collection - The Finalize () Method - A Stack Class - Overloading Methods: Overloading Constructors, Using Objects As Parameters - A Closer Look At Argument Passing - Returning Objects - Recursion - Introducing Access Control - Understanding Static - Introducing Final - Arrays Revisited - Introducing Nested And Inner Classes - Exploring The String Class - Using Command-Line Arguments - Varargs: Variable-Length Arguments, Overloading Vararg Methods, Varargs And Ambiguity	07
Unit-5	**Inheritance** Inheritance Basics - Using Super - Creating A Multilevel Hierarchy - Method Overriding - Dynamic Method Dispatch - Using Abstract Classes - Using Final With Inheritance - Using Final To Prevent Overriding - Using Final To Prevent Inheritance - The Object Class	06
Unit-6	**Packages And Interfaces** Packages: Defining A Package, Finding Packages And CLASSPATH - Access Protection: Importing Packages - Interfaces: Defining An Interface, Implementing Interfaces, Nested Interfaces, Applying Interfaces, Variables In Interfaces	06
Unit-7	**Exception Handling** Exception Handling Fundamentals - Exception Types: Uncaught Exceptions, Using Try And Catch, Multiple Catch Clauses, Nested Try Statements, Throw, Throws, Finally - Java's Built-In Exception - Creating Your Own Exception Subclasses - Chained Exceptions - Using Exceptions	06
Unit-8	**Multithreaded Programming** The Java Thread Model - Thread Priorities - Synchronization - Messaging - The Thread Class And The Runnable Interface - The Main Thread - Creating A Thread - Implementing Runnable - Extending Thread - Choosing An Approach	06

	- Creating Multiple Thread - Using Isalive() And Join() - Thread Priorities - Synchronization - Interthread Communication – Deadlock	
Unit-9	**The Applet Class** Applet Basics - The Applet Class - Applet Architecture - An Applet Skeleton - Applet Initialization And Termination - Overriding Update( ) - Simple Applet Display Methods - Requesting Repainting - Using The Status Window - The Html Applet Tag - Passing Parameters To Applets - getDocumentBase( ) and getCodeBase( )	06

REFERENCES

1.	The Complete Reference: Java by Herbert Schildt, TMH Publication
2.	Let Us Java by Yashvant Kanetkar, BPB Publication
3.	Programming With Java by E. Balaguruswami, TMH Publication
4.	Theory and Problems of Programming with Java, Hubbard, J. R. TMH
5.	Java Programming Language By Ken Arnold, James Gosling, David Holmes, AW Publication

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology		ACADEMIC YEAR 2021-2022	
Diploma in Information Technology : Regular (Grant-in aid)				
Year	II	**Core/~~Elective/Foundation~~** **Subject Name : DATABASE MANAGEMENT SYSTEM**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Introduction to Database System** Introduction to Database, Basic Concepts and Definitions, Data Dictionary Database, Database system, Data Administrator (DA),Database Administrator (DBA),File oriented System versus database system	06
Unit-2	**Database System Architecture** Schemas, Sub-schemas, and Instances, Three-level ANSI SPARC Database Architecture, Data Independence, Mappings, Structure Components, Functions of DBMS, Data Models, Types of Database System	06
Unit-3	**Relational Database Management System** An Overview Of RDBMS - Dr. E. F. Codd's Rules For RDBMS - DBMS V/S RDBMS	05
Unit-4	**Introduction To Oracle** Overview Of Structured Query Language: Features Of SQL And SQL *PLUS, SQL V/S SQL *PLUS - SQL Delimiters - Components Of SQL - Table Fundamentals: Oracle Data Types, CREATE Table Command, Viewing Data In The Table, Eliminating Duplicate Rows, Sorting Data In A Table, Creating A	07

	Table From A Table, Inserting Data Into A Table From Another Table, Delete Operation, Updating The Contents Of A Table, Modifying The Structure Of Table, Renaming, Truncating, Destroying Tables, Creating Synonyms	
Unit-5	**Data Constraints** Types Of Data Constraints: I/O Constraints: Primary Key, Foreign Key, Unique Key - Business Rule Constraints: Column Level, Table Level, NULL Value Concept, NOT NULL Constraint, CHECK Constraint	05
Unit-6	**Oracle Operators And Functions** Arithmetic Operator - Logical Operator - Range Searching - Pattern Matching - Oracle Table: DUAL, Oracle Functions, Date Conversion Functions, Date Functions, Miscellaneous Function	05
Unit-7	**Interactive SQL** Grouping Data From Tables In SQL: GROUP BY Clause, HAVING Clause, GROUP BY Using ROLLUP And CUBE Operator, Subqueries - Joins: Inner Join (Equi Join), Outer Join, Cross Join, Self Join - Concatenating Data From Table Columns: Using Union, Intersect And Minus Clause - Dynamic SQL	06
Unit-8	**Advance SQL** INDEXES: Multiple Indexes On A Table - Using ROWID To Delete Duplicate Rows From A Table - Using ROWNUM In SQL Statements - VIEWS - CLUSTERS: Cluster Indexes, When To Cluster, Types Of Cluster - SEQUENCES – SNAPSHOTS	06
Unit-9	**Security Management Using SQL** Granting And Revoking Permissions - Revoking Privileges Given	05
Unit-10	**Transaction Management** Transactions - Transaction Recovery - System Recovery - Two-Phase Commit - Save Points - Concurrency - Three Concurrency Problems - Locking - Deadlock - Serializability - Isolation Levels - Intent Locking - Dropping ACID	05

REFERENCES

1.	Database Systems Concepts, design and Applications, S. K. Singh Pearson Education
2.	Database System Concepts, Henry Korth, MGH
3.	PL/SQL, ORACLE Press, TMH
4.	An Introduction to Database Systems, C. J. Date, Pearson Education
5.	SQL, PL/SQL the Programming Language of Oracle By Ivan Bayross
6.	ORACLE complete reference, ORACLE PRESS, TMH

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology		ACADEMIC YEAR 2021-2022	
Diploma in Information Technology : Regular (Grant-in aid)				
Year	II	**Core/~~Elective/Foundation~~** **Subject Name : PYTHON PROGRAMMING**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS		
PROPOSED SYLLABUS		
		Hours
Unit-1	**Introduction to Python** History, Features of Python, Downloading and Installing, Running Python, The basic elements of python, The print statement, comment, statements and syntax, variable assignments, identifiers	08
Unit-2	**Objects and numbers** Python Objects- Standard types, Other built-in types, Internal types Numbers- Integer, Double precision floating point, complex numbers, operators	08
Unit-3	**Conditional statements and loops** If, else, elif, conditional expressions, while, for, break , continue, pass, command line arguments	07
Unit-4	**Functions and scoping** Creating Functions, Passing Functions, Functional Programming, Scope of variables, Modules, Files, packages	07
Unit-5	**Structured types, mutability and higher-order functions** Strings, Tuples, Lists and Dictionaries, Lists and Mutability, Functions as Objects	07
Unit-6	**Classes and object oriented programming** Abstract Data Types and Classes, Inheritance, Encapsulation and Information Hiding	07
Unit-7	**Regular expressions** Match function, search function, Regular Expression Modifiers, Patterns	06
Unit-8	**Web programming** Introduction, Creating Simple Web Client, CGI, Building CGI Applications	06

REFERENCES	
1.	Wesley J. Chun. “Core Python Programming - Second Edition”, Prentice Hall
2.	John V Guttag. “Introduction to Computation and Programming Using Python”, Prentice Hall of India
3.	Kenneth A. Lambert, “Fundamentals of Python – First Programs”, CENGAGE Publication

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology		ACADEMIC YEAR 2021-2022	
Diploma in Information Technology : Regular (Grant-in aid)				
Year	II	**Core/~~Elective/Foundation~~** **Subject Name : OPERATING SYSTEMS**	Lecture Hrs per week	4
Semester	II		Max marks	100
COURSE CONTENT / SYLLABUS				

PROPOSED SYLLABUS		
		Hours
Unit-1	**Overview Of Operating System** Operating System: Objectives And Functions, Components Of Operating System - Evolution Of Operating System - Types Of Operating System - Operating System Structure - Operating System Operations - Operating System Services - System Calls: Types Of System Calls - Concept Of Virtual Machine.	09
Unit-2	**Process Management** Process Concept - Operations On Processes - Process States - Process Control Block - Process Scheduling: Types Of Schedulers, Context Switching - Threads - Multithreading Models - Types Of Threads - Scheduling Criteria - Scheduling Algorithms - Performance Evaluation Of Scheduling.	09
Unit-3	**Deadlock** Deadlock: Deadlock Characteristics, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection And Recovery.	07
Unit-4	**Memory Management** Basics Of Memory Management - Swapping - Memory Allocation Types - Paging - Segmentation - Virtual Memory: Demand Paging, Paging And Page Replacement Algorithms, Thrashing.	08
Unit-5	**File Management** File Concept: File Attributes And Objectives, File Operations, File Types, File System Structure, File Access Methods - Directory Structure - File System Structure - File System Implementation - Directory Implementation - File Allocation Methods - Free Space Management	08
Unit-6	**Security And Protection** Principles Of Security - Security Threats And Goals - Security Policies And Mechanisms - Authentication - Protection And Access Control - Malware – Defenses.	07
Unit-7	**UNIX** Overview, Features, Components, File Types and Access, Permission, Disk Structure of root, Structure of File System, General Purpose commands File Handling commands, Pipelining, Redirection, Tees and Shell Variables, Shell environment and programming, The if statement, the case statement, looping with for, while and until statements.	08

REFERENCES

1.	Operating System By William Stallings, Prentice Hall of India, 4th Edition, 2003
2.	Operating System Concepts By Abraham Silberschatz and James L., Addision Wesley Pub Company
3.	Introduction to Operating Systems By Harvey M. Deital, Addision Wesley Publishing Company
4.	Operating Systems – Design and Implementation By Andrew S. Tanenbaum, Prentice Hall of India, New Delhi
5.	Operating Systems , Concepts and Design By Milan Milenkovie , TMGH, New Delhi
6.	Operating Systems – A Concept Based Approach By D.M. Dhamdhere, TMGH, New Delhi
7.	Unix Concepts And Application Sumitabha Das MGH

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2021-2022

Diploma in Information Technology : Regular (Grant-in aid)

Year	II	**Core/~~Elective/Foundation~~** **Subject Name : SOFTWARE ENGINEERING**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hours
Unit-1	**Overview Of Software And Software Engineering** Evolution Of Software - Definition And Characteristics Of Software - Categories Of Software - Software Applications - Software Engineering: Definition, Need - Software Engineering: A Layered Technology Approach - The Software Process - Prescriptive Process Models: Waterfall Model, Linear Sequential Model, Prototyping Model, RAD Model, Incremental Model, Spiral Model - Agile Software Development: Difference Between Prescriptive And Agile Process Model, Features Of The Agile Software Development Approach, Concept Of Extreme Programming	09
Unit-2	**Software Engineering Practices And Software Requirements Engineering** Software Engineering Practices - Core Principles Of Software Engineering - Communication Practices - Planning Practices - Modelling Practices: Analysis Modelling, Design Modelling - Construction Practices: Concept Of Software Construction, Coding , Testing - Software Deployment: Concept Of Delivery Cycle, Support Cycle & Feedback Cycle, Deployment Principles	08
Unit-3	**System Requirement Specification** Understand Need - Role And Tasks Of System Analyst - Data Dictionary - Feasibility Analysis - Data Flow Diagrams: Context Diagram, Logical Data Flow Diagram, Physical Data Flow Diagram - Development Of Use Cases: Use Case Definition, Purpose Of A Use Case, Use Case Diagram - SRS (Software Requirements Specifications): Concept Of SRS, General Format Of SRS - Need/Importance Of SRS	08
Unit-4	**Software Project Measurement And Planning** Measures, Metrics And Indicators - Software Measurement: Size-Oriented Metrics, Function-Oriented Metrics - Software Quality Measures - Scheduling And Time Line Chart - Software Scope - Resources - Estimation Techniques - Empirical Estimation Model – Outsourcing	07
Unit-5	**Software Testing Strategies** Software Testing Fundamentals: Definition Of Software Testing, Good Test, Successful Test, Testing Strategies, Test Plan, Test Data - Test Case Design - Characteristics Of Testing Strategies - Software Verification And Validation - Testing Strategies: Unit Testing, Integration Testing, Top-Down Approach, Bottom-Up Approach, Regression Testing, Smoke Testing, Validation Testing -	08

	Alpha And Beta Testing (Concept And Differences) - System Testing: Types - White-Box And Black-Box Testing	
Unit-6	**Risk Management** Risk Management: What Is Software Risk?, Proactive And Reactive Risk Strategies, Types Of Software Risks - Risk Assessment: Risk Identification, Risk Analysis, Risk Prioritization - Risk Control: Need, RMMM Strategy - Software Configuration Management (SCM): Need Of SCM, Benefits Of SCM, SCM Repository-Functions And Features Supported, SCM Process- Change Control And Version Control	08
Unit-7	**Software Quality Management** Basic Quality Concepts - Software Quality Assurance (SQA): Definition Of SQA, SQA Activities - Concept Of Statistical SQA - Quality Evaluation Standards: Six Sigma For Software, Concept Of DMAIC And DMDAV - Approach: ISO 9000 For Software - Concept And Major Considerations - CMMI - CMMI Levels, Process Areas Considered - CMMI Vs ISO - MCCALL's Quality Factors	08

REFERENCES

1.	Software Engineering - A Practitioner's Approach By Roger S. Pressman, TATA McGraw-Hill Publication
2.	Software Engineering By Pankaj Jalote, Wiley India Publication
3.	Software Engineering By Somerville, Pearson education PHI Publication
4.	Software Engineering, Dreamtech Press Publication
5.	Software Engineering By K. K. Aggarwal, Yogesh Singh, New Age International Publishers

Semester 5:

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	III	**Core/~~Elective/Foundation~~** **Subject Name : COMPUTER GRAPHICS**	Lecture Hrs per week	4
Semester	I		Max marks	100
COURSE CONTENT / SYLLABUS				
PROPOSED SYLLABUS				
				Hrs
Unit-1	**Overview of Computer Graphics** Characteristics Of Computer Graphics, Components Of Computer Graphics, Classification of Computer Graphics, Application of Computer Graphics, Advantages of Computer Graphics, Display Devices, Raster Scan Systems, Random Scan System, Graphics Input Devices, Graphics Output Devices, Graphics Software and Standards.			**10**
Unit-2	**Scan Conversion**			**12**

	Points and Lines, Line Drawing Algorithms: DDA Algorithm, Bresenham's Line Algorithm, Parallel Algorithm; Properties of Circle, Circle Generating Algorithms: DDA Circle Algorithm, Bresenham's Circle Algorithm, Midpoint Circle Drawing Algorithm; Ellipse Generating Algorithm: Properties of Ellipse, Midpoint Ellipse Algorithm, Fill Area Primitives: Inside-Outside Test, Solid Area Filling algorithms: Boundary Fill Algorithm, Flood Fill Algorithm, Scan Line Feed Algorithm, Scan Line Seed Fill Algorithm; Character Generation	
Unit-3	**2D Transformation** 2D Basic Transformations: Translation, Rotation, Scaling, Homogeneous Coordinates, Composite Transformations, Reflection and Shear Transformation, Transformation between Coordinate Systems, Inverse Transformation	**8**
Unit-4	**2-D Viewing and Clipping** Windows and Viewport, Viewing Transformation, Clipping of line in 2-D: Cohen-Sutherland Line Clipping Algorithm, Midpoint Subdivision Method, Liang-Barsky Line Clipping Algorithm, Cyrus-Beck Line Clipping Algorithm, Nicholl-Lee-Nicholl Line Clipping Algorithm; Polygon Clipping: Sutherland Hodgman Polygon Clipping, Weiler-Atherton Algorithm; Curve Clipping, Text Clipping, Exterior Clipping	**12**
Unit-5	**Multimedia** Concepts of Multimedia: Elements of Multimedia system, Types Of Multimedia, Hardware and Software Requirements, Applications of Multimedia, Multimedia Authoring; Digital Audio, MIDI, Image Compression Standards, Video Compression and Encoding, Hypertext and Hypermedia	**10**
Unit-6	**Animation** Categories of Animation, Principle of Animation systems, Design of Animation Sequences, Problems in Computer Animation, Animation Functions, Animation Techniques, Uses of Animation, Animation Software, Animation File Formats.	**8**

REFERENCES

1.	Computer Graphics, D.Hearn And P.Baker - Pearson Eduction - C Version
2.	Computer Graphics, Udit Agrawal
3.	Computer Graphics, A Practical Approach, Concepts, Principles, Case Studies, Experiments, Er. Raiiv Chopra, S. Chand and Company Ltd.
4.	Computer Graphics, Multimedia and Animation By Pakhira Malay K
5.	Computer Graphics By Isrd Group
6.	Computer Graphics By Pradeep K. Bhatia, I.K International Pvt Ltd.
7.	Computer Graphics, Foley and van Dam - Person Education.
8.	Computer Graphics, Sinha & Udai, - TMH.
9.	Computer Graphics, Peter Shirley, Steve Marschner, Cengage Learning

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	III	**Core/~~Elective~~/~~Foundation~~** **Subject Name: COMPUTER NETWORKS**	Lecture Hrs per week	4
Semester	I		Max marks	100

COURSE CONTENT / SYLLABUS		
PROPOSED SYLLABUS		
		Hrs
Unit-1	**Introduction To Computer Network** Application And Evolution Of Computer Networks: Definition & History Of Networks, Usage Of Computer Networks, Internet - Network Topologies - Categories Of Network: Based On Scope, Based On Connection, Standard Organizations And Protocols - OSI Model: OSI Model Layers, Functions Of Each Layer Of OSI Model -TCP/IP Model - Connection Oriented And Connectionless Approach - Comparison Of OSI And TCP/IP Model - LAN (Wired And Wireless)	12
Unit-2	**Interconnection Devices** Client And Server - Transmission Media: Guided Media, Unguided Media - Connectors - NIC - Repeaters - Bridges - Routers - Access Points - Gateway - Hubs – Switches	10
Unit-3	**Data Link Layer** Packet Switching - Circuit Switching - Message Switching - Error Control - Flow Control - Framing - Frame Relay: Architecture - Frame Relay Layers - ATM: Architecture, error correction and detection	10
Unit-4	**Network Layer** Network Layer Design Issues - Routing Algorithms - IPV4 And IPV6 Protocol Logical Addressing Scheme	08
Unit-5	**Application Layer** Principles Of Application Layer Protocols - Domain Name System: DNS - The File Transfer Protocol : Ftp - Electronics Mail In The Internet : POP, HTTP, IMAP,SMTP - WWW And HTTP - Network Management SNMP	10
Unit-6	**Internet** Components Of Internet - Connection Of Internet	06

REFERENCES

1.	Computer Networks (3rd Edition) By Andrew S. Tanenbaum, PHI Publications
2.	Data Communications & Networking By Behrouz A Forouzen, Tata McGraw-Hill Publications
3.	Computer Networks and Internets (2nd Edition) By Douglas E. Comer, Pearson Publication
4	Computer Network By S.S. Shinde, New Age International Publisher
5	Computer Networking Top Down Approach By Kurose, Ross, Pearson Publication

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	III	**Core/~~Elective~~/~~Foundation~~** **Subject Name: MOBILE APPLICATION DEVELOPMENT**	Lecture Hrs per week	4
Semester	I		Max marks	100
COURSE CONTENT / SYLLABUS				

PROPOSED SYLLABUS		
		Hrs
Unit-1	**Mobile Technology** Overview of Android - An Open Platform for Mobile development, Open Handset Alliance, Use of Android for mobile app development, Android Marketplaces, Android Development Environment setup, Android Studio, Creating & setting up Android emulator, Android Project Framework and its applications	08
Unit-2	**Android Architecture** Linux Kernel, Libraries, Android Runtime, Application Framework, Applications, Android Startup and Zygote, Android Debug bridge, Android Permission model, Android Manifest File	06
Unit-3	**Design Android UI Layout** Android application components: Intent, Activity, Activity Lifecycle, Broadcast receivers, Services and Manifest, Create Application and new Activities, Expressions and Flow control, Android Manifest, Simple UI -Layouts and Layout properties, Fundamental Android UI Design, Introducing Layouts, Creating new Layouts, Drawable Resources, Resolution and density independence (px,dp,sp)	08
Unit-4	**Develop event driven Programming in Android** Event driven Programming in Android (Text Edit, Button clicked etc.), Creating a splash screen, Android Activity Lifecycle, Introduction to threads in Android	12
Unit-5	**Develop application with menus and dialog boxes, Menu** Custom Vs. System Menus, Creating and Using Handset menu Button (Hardware), Android Themes, Dialog, create an Alter Dialogue, Toast & SnackBar in Android, List & Adapters, Android Manifest.xml File	12
Unit-6	**Develop applications with database SQLite** Open Helper and create database, Open and close a database, CRUD operation in database, Introduction to Firebase & database programming	10

REFERENCES

1.	Professional Android 2 Application Development Reto Meier Wiley India Pvt Ltd
2.	Beginning Android Mark L Murphy Wiley India Pvt Ltd
3.	Professional Android Sayed Y Hashimi and Satya Komatineni Wiley India Pvt Ltd

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	III	**Core/~~Elective/Foundation~~** **Subject Name: .NET TECHNOLOGIES**	Lecture Hrs per week	4
Semester	I		Max marks	100
COURSE CONTENT / SYLLABUS				
PROPOSED SYLLABUS				
				Hrs

Unit-1	**Introduction To .NET Framework** Managed Code and The CLR - Intermediate Language - Metadata and JIT Compilation - Automatic Memory Management - Language Concepts and The CLR: Visual Studio .Net, Using The .Net Framework - The Framework Class Library: .Net Objects, Asp .Net, .Net Web Services, Windows Forms	10
Unit-2	**Introduction To Visual Basic .NET** Elements: Variables and Constants: Data Types, Declaration – Operators – Types of Precedence - Expressions - Program Flow - Decision Statements: If..Then, If..Then..Else, Select..Case - Loop Statements: While..End, While, Do..Loop, For..Next, For..Each..Next - Types: Value Data Types – Structures - Enumerations - Reference Data Types - Single-Dimensional - Multi-Dimensional Arrays - Jagged Arrays - Dynamic Arrays - Windows Programming: Creating Windows Forms - Windows Controls: Button, Check Box, Combo Box, Label, List Box, Radio Button, Text Box – Events: Click, Close, Deactivate, Load, Mouse Move, Mouse Down, Mouse Up - Menus And Dialog Boxes: Creating Menus, Menu Items, Context Menu, Using Dialog Boxes, Show Dialog () Method.	12
Unit-3	**Application Development Using ADO .NET** Features Of Ado.Net: Architecture Of Ado.Net - Ado.Net Providers Connection – Command - Data Adapter – Dataset - ExecuteNonquery() - ExecuteScalar() - Execute Reader() - DataAdapter Class - Dataset Class - DataView Class - Accessing Data With Ado.Net: Connecting To Data Source, Accessing Data With Data Set And Data Reader, Create An Ado.Net Application, Using Stored Procedures.	11
Unit-4	**C# Language Fundamentals** Classes and Objects – Methods - Fields And Properties - Inheritance And Polymorphism - Operator Overloading – Struts – Interfaces – Arrays - Indexers And Collections - Strings And Regular Expressions - Handling Exceptions - Delegates And Events.	11
Unit-5	**ASP.NET & ADO.NET Connectivity through ASP.NET Web Forms** Asp.Net Features: Change The Home Directory In IIS, Add A Virtual Directory In IIS, Set A Default Document For IIS, Change Log File Properties For IIS, Stop, Start, Or Pause A Web Site - Creating Web Controls: Web Controls, Html Controls, Using Intrinsic Controls, Using Input Validation Controls, And Selecting Controls For Applications, Adding Web Controls To A Page, Creating Web Forms: Server Controls - Types Of Server Controls - Adding Asp.Net Code To A Page - Working And Update Web Form For Adding Data To Database - Update And Delete Data To Database, Data Binding Through Gridview.	12

REFERENCES

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

Semester 6:

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology	ACADEMIC YEAR 2021-2022

Diploma in Information Technology : Regular (Grant-in aid)

Year	III	~~Core/Elective~~/Foundation **Subject Name: INFORMATION SECURITY**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hrs
Unit-1	**Concept of Security** Security Trends - Security Goal - The OSI Security Architecture - Security Services - Mechanisms and Attacks - A Model for Network Security - Concepts of Authorization and Authentication	08
Unit-2	**Symmetric Ciphers** Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Steganography - Block Ciphers and Data Encryption: Block Ciphers Principles - Data Encryption Standard - The strength of DES - Block Cipher Design Principles - Advanced Encryption Standard: Evaluation Criteria for AES - The AES Cipher - Block Cipher Modes of Operation - Traffic Confidentiality - Key Distribution	12
Unit-3	**Public-Key Encryption** Principles of Public-key Cryptosystems - The RSA Algorithm - Key Management in public-key cryptosystem - Diffie-Hellman Key Exchange - Elliptic Curve Cryptosystems	10
Unit-4	**Message Authentication** Authentication Requirements - Authentication Functions - Message Authentication Codes - Digital Signatures	08
Unit-5	**Network Security Applications** Authentication Applications: Kerberos, X.509 Authentication Service - Public Key Infrastructure - Electronic Mail Security: Pretty Good Privacy, S/MIME - Web Security: Secure Socket Layer and Transport Layer Security, Secure Electronic Transactions	10
Unit-6	**System Security** Intruders - Intrusion Detection - Password Management - Viruses and related threats – Firewalls	08

REFERENCES

1.	Network Security Essentials (2nd Edition) By William Stallings, Prentice Hall. 2003
2.	Network Security Principles and Practices (CCIE Professional Development) By Saadat Malik, Saadat Malik, Pearson Education
3.	Cryptography And Network Security By Stallings William, William Stallings, Pearson Publication Inc.
4	Cryptography and Network Security By Atul Kahate, Tata McGraw-Hill Education

5	Computer Security Basics, Deborah Russell By G. T. Gangemi, O'Reilly Media, Inc.
6	Computer Security By Dieter Gollmann, John Wiley & Sons

1	**The Maharaja Sayajirao University of Baroda** Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	III	~~**Core/Elective/**~~**Foundation** **Subject Name: ARTIFICIAL INTELLIGENCE**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hrs
Unit-1	**Introduction to Artificial Intelligence** What is AI, Applications of AI, characteristics, advantages and disadvantages Problems, Problems Space and Search, Heuristic Search Techniques: Defining The Problems as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics, Issues In The Design Of Search Programs Heuristic Search Techniques: Hill Climbing, A*, AO*, Simulated Annealing, Branch and Bound, Nearest Neighbor, Blind Search Techniques: DFS, BFS, Best First Search, Control Strategies.	08
Unit-2	**Logic and Programming Languages in AI** Logic: Propositional Logic, Predicate Logic and Fuzzy Logic, Monotonic and non-Monotonic Prolog Languages: Introduction to Prolog: Syntax & Numeric Function, Basic List Manipulation Functions in Prolog, Functions, Predicates & Conditional, Input, Output & Local Variables, Iteration & Recursion, Property Lists & Arrays. GUI Version of Prolog. Python Programming: Syntax, Data Type, Libraries, NumPy, Numba, NumExpr, SciPy, AstroPy, Pandas, SymPy, MatplotLib, Jupyter, IPython.	10
Unit-3	**Knowledge Representation** Knowledge Representations and Mappings, Approaches To Knowledge Representation. Representing Knowledge using Rules: Procedural Versus Declarative Knowledge, Logic Programming, and Forward Versus Backward Reasoning.	08
Unit-4	**Reasoning** Symbolic Reasoning Under Uncertainty and Statistical Reasoning: Introduction to Non-Monotonic Reasoning, Logics for Nonmonotonic Reasoning Statistical Reasoning: Probability And Bays' Theorem, Certainty Factors And Rule-Base Systems, Bayesian Networks, Dempster-Shafer Theory	10
Unit-5	**NLP and Text Analytics and Neural Networks**	10

	NLP and Text Analytics: Introduction, Syntactic Processing, Semantic Analysis, Semantic Analysis, Discourse and Pragmatic Processing, Text Analytics, Text pre-processing, Bag of Words, Word Cloud, Machine Translation, sentiment analysis Neural Networks: Introduction: Simple Perceptron, Hopfield Network, Learning in Neural Network, Application Of Neural Networks, Recurrent Networks, Deep Neural Network, Convolution Network, Restricted Boltzmann machine, Transfer learning	
Unit-6	**Expert Systems, Optimization Techniques, Machine Learning and Deep Learning** Expert Systems: An Introduction to Expert System, Explanation Facilities, Expert System Developments Process, Knowledge Acquisition. Optimization Techniques: Genetic Algorithm (GA), Ant Colony Optimization (ACO), Particle Swarm Optimization(PSO), Honey Bee Machine Learning and Data Analytics, Introduction to Deep Learning	10

REFERENCES

1	"Artificial Intelligence" -By Elaine Rich and Kevin Knight (2nd Edition) Tata Mcgraw-Hill.
2	Stuart J. Russell and Peter Norvig, Artificial Intelligence 3e: A Modern Approach, 3rd Edition. Pearson
3	Introduction to Prolog Programming By Carl Townsend
4	"Artificial Intelligence And Expert Systems "By D.W.Patterson
5	Introducing Python by Lubanovic Bill, O ReILLY
6	Python Machine Learning, Sebastian Raschka

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	III	~~**Core/Elective/**~~**Foundation** **Subject Name: ADVANCED COMPUTING TECHNOLOGIES**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hrs
Unit-1	**Basics of E-Commerce** Overview - Types of E-Commerce - Business to Customer (B2C) - Customer to Customer (C2C) - Business to Business (B2B) - Advantages and Disadvantages of E-Commerce	06
Unit-2	**Payment System in E-Commerce** Requirement Of E-Payment System - Credit Card Payment - Electronic Funds Transfer - Electronic Cheque Payment - Electronic Cash - Payment Gateways - Micro – Payment For Information Goods	08
Unit-3	**Applications of E-commerce** E-Marketing, EDI, E-CRM, E-SCM	08
Unit-4	**Introduction to Cloud Computing**	08

	History of cloud computing, Cloud service options, Cloud Deployment models, Business concerns in the cloud, Cloud Computing Services	
Unit-5	**Virtualization and Cloud Platforms** Exploring virtualization, Load balancing, Hypervisors, Machine imaging, Cloud marketplace overview, Comparison of Cloud providers.	08
Unit-6	**Introduction to AWS** AWS history, AWS Infrastructure, AWS services, AWS ecosystem	08
Unit-7	**Introduction To Big Data** Introduction, Types Of Big Data, Characteristics, benefits, Big Data and its importance, Drivers, Big data analytics, Big data applications. Algorithms, Matrix-Vector, Multiplication by Map Reduce.	10

REFERENCES

1	E-commerce, P. T. Joseph, S. J., PHI Publication
2	Introduction to E-Commerce, Ravi Kalakota, Andrew B. Whinsten, Edison Wisley Publication
3	Cloud Computing Bible. Barrie Sosinsky. John Wiley & Sons. ISBN-13: 978-0470903568.
4	Amazon Web Services For Dummies. Bernard Golden. For Dummies. ISBN-13: 978- 1118571835
5	Understanding Big data, Chris Eaton, Dirk deroos et al McGraw Hill, 2012.

	The Maharaja Sayajirao University of Baroda Department of Electrical Engineering & Information Technology			ACADEMIC YEAR 2021-2022
Diploma in Information Technology : Regular (Grant-in aid)				
Year	III	~~**Core/Elective/**~~**Foundation** **Subject Name: OPTIMIZATION TECHNIQUES**	Lecture Hrs per week	4
Semester	II		Max marks	100

COURSE CONTENT / SYLLABUS

PROPOSED SYLLABUS

		Hrs.
Unit-1	Linear Programming I- Model Formulations, Simplex Algorithms, Duality of Problems, Sensitivity analysis	12
Unit-2	Linear Programming II- Transportation and Assignment Problems, Travelling Salesman problem	10
Unit-3	CPM PERT – Project Networks, Critical Path Method, Network Crashing and Optimization	10
Unit-4	Simulation Models	08
Unit-5	Queuing Models	08
Unit-6	Replacement Models	08

REFERENCES

1.	Operations Research - JK Sharma, MacMillan Business books
2.	Quantitative Techniques in Management – N D Vohra, Tata MacGraw Hill Education