SCHEMEOFEXAMINATION & SYLLABUS

of

PGDCA

(POST GRADUATE DIPLOMA IN COMPUTER APPLICATION)

UNDER

Faculty of Information Technology

w.e.f.Session 2021-22

PGDCAI SEMESTER					
Subjectcode	**SubjectName**	**Credit 1 Cr=10hrs**	**University ExamMarks**	**Internal Marks**	**Total Marks**
PGDCA101	Fundamental of Information Technology	4	70	30	100
PGDCA102	Programmingin C++	4	70	30	100
PGDCA103	DBMSConcepts	4	70	30	100
PGDCA104	BusinessCommunication	4	70	30	100
PGDCA105-P	Practical Based on Office Automation and DBMS Concepts	2	30	20	50
PGDCA106P	PracticalBasedonC++	2	30	20	50
	Total	**20**	**340**	**160**	**500**

PGDCAII SEMESTER					
Subjectcode	**SubjectName**	**Credit 1Cr=10hrs**	**University ExamMarks**	**Internal Marks**	**Total Marks**
PGDCA201	ProgrammingusingVB.NET	4	70	30	100
PGDCA202	ProgramminginPython	4	70	30	100
PGDCA203	WebTechnology&Multimedia	4	70	30	100
PGDCA204	DataStructures	4	70	30	100
PGDCA205-P	PracticalBasedon VB.NET&Python	2	30	20	50
PGDCA206P	MiniProject	3	30	20	50
	Total	**21**	**340**	**160**	**500**
	GrandTotal (SEMI+SEMII)	**41**	**680**	**320**	**1000**

FACULTYOFINFORMATIONTECHNOLOGY

NameoftheProgram/Semester:PGDCA-I	**Course:PGDCA**
Nameofthecourse:FundamentalofInformationTechnology	**CourseCode:PGDCA101**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

Objective:

1. Tounderstandthegenerationandclassificationofcomputersystem.
2. Tofamiliarizetheconceptofinternetanditsrelatedtechnologies.
3. Togainknowledgeofvariousoperatingsystems.

CourseOutcome:

C01:Tounderstandthegenerationandclassificationofcomputersystem. **CO2**: To familiarize the concept of internet and its related technologies. **CO3**: To gain knowledge of various operating systems.
CO4:Knowevolutionofdigitalcomputerand varioustechnologies.
CO5:Acquiretheknowledgetheinternetandrelatedtechnologies.

UNIT– I: **ContactHours:2**

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilitiesandlimitations,Types ofcomputersGenerations ofcomputers, Personal Computer (PCs) –evolution of PCs,configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic Components ofa computer system -Controlunit,ALU, Input/output functionsandcharacteristics,memory-RAM, ROM, EPROM, PROM and other types of memory, Number System.

UNIT– II: **ContactHours:2**

Input/output& Storage Units-:Keyboard, Mouse, Trackball, Joystick, Scanners, Digital Camera, MICR, OCR,OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Printers & types - Daisywheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, Various Storage Devices - Magnetic Tape, MagneticDisks, CartridgeTape, HardDiskDrives, FloppyDisks(Winchester Disk), Optical Disks, CD, CD-R, CD-RW, Zip Drive, flash Physical structure of floppy & hard disk.

UNIT– III: **ContactHours:2**

Software and its Need, Types of Software - System software, Application software, System Software - Operating System, UtilityProgram, Programming languages, Assemblers, Compilersand Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table, files & directory structure and its naming rules, bootingprocess,Programminglanguages-Machine,Assembly,HighLevel,4GL,theirmeritsanddemerits,

Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, DOS commands. Multimediaconcepts,multimediasystemconfiguration,typesofmultimedia,applicationofMultimedia.

UNIT– IV: **ContactHours:2**

UseofcommunicationandIT, Communication Process, Communicationtypes-Simplex, HalfDuplex, 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 and E - Commerce

UNIT– V: **ContactHours:2**

System Planning and initial investigation: basis for planning in systems analysis, initial investigation, fact finding, fact analysis, determination of feasibility. Information Gathering: Kind of information, Information gathering tools, Structured Analysis, DFD, Data Dictionary, Decision Tree, Structured English, Decision Table. SystemPerformance & Feasibility Study. Software Engineering Fundamentals: Software Design Life cycle The Role of System Analyst

TEXT&REFERENCEBOOKS:

- AnuragSeetha,"IntroductiontoComputersandInformationTechnology",RamPrasad&Sons,Bhopal.
- S.K.Basandra,"ComputersToday",Galgotia Publications.
- ChetanShrivastav"FundamentalofIT"
- P.K.Sinha,"FundamentalofComputers"
- SystemAnalysisandDesign-EliasM.Awad.
- SystemAnalysisandDesign-AlanDennis&BarbaraHaleyWixo
- IntroductiontoDatacommunication&Networking-Behrouz&Forouzan
- ComputerNetworking-Andres&Tanenbaum

CO#	COGNITIVE ABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Rememberinginprograminginvolvesrecallingsyntax,languageconstructs, andpredefinedfunctionsinprogramming.
CO2	UNDERSTANDING	Understandinghowcodeworksthecontrolstructureslikeloopsand conditionalsandhowtheyaffectprogramflow.
CO3	APPLYING	Applyinginvolvesusingyourunderstandingtowritecodetosolvespecific problems.
CO4	ANALYSING	Analyzingincludesdebuggingandtroubleshootingcodetoidentifyandfix errorsorissues.
CO5	EVALUATING	Evaluationinvolvecomparingdifferentapproachestosolvingaproblemand selecting the most suitable one based on criteria like speed, resource usage, andcodesimplicity.

1. PREAMBLE:

This one year Post Graduate Diploma in Computer Applications (PGDCA) course aims to give adequateexpertise to a student to enable him/her to utilize computers for maximum benefit in an Office or Business environment. It will also enable a student to develop programs of his/her own to enhance productivityin such an environment. It will provide the necessary skills to make the successful candidates proficient in software development, paving the way for self-employment. The course is oriented more towards Programming and Software than to Hardware.

2. INTRODUCTIONTOPROGRAM:

PGDCAisaoneyear longprofessionalpost-graduateprogrammefor candidateswantingtodelvedeeper intothe world of computer application development.

This programme is designed to provide higher level education in Information Technologies. Graduates of Arts, Science, Management &Commerce stream whowishtomake along-term careerin InformationTechnologycan choose this course and have requisite strong foundation forpursuing masters in Information Technology. It is also helpful to students who want to pursue higher studies from Universities.

The Programme prepares the students to seek compatible job opportunities in the industry as well as make them readyto pursuemaster's programmein IT. Theapproach is to preparestudents from diverse fields in developing skills related to programming and understanding the concepts related to Computers and its applications. The programme is designed to develop the coding and analytical ability of the students.

3. PGDCAPROGRAMMEFOCUS:

ProgramEducationalObjective(PEOs)

PEO1: To prepare graduates who are proficient in fundamental concepts and principles of computer science and its applications, enabling them to apply this knowledge to solve real-world problems.

PEO2: To provide graduates with a strong foundation in programming languages, algorithms, data structures, software engineering, database management, and other core areas of computer science, enablingthem to design, develop, and implement software solutions.

PEO3: To prepare graduates with communication and collaboration skills to work effectively inmultidisciplinary teams, adapt to changing technological landscapes, and engage in lifelong learning.

PEO4: To equip graduates with ethical and professional values, enabling them to make ethical and responsible decisions, understand the impact of their work on society, and contribute positivelyto the community.

PEO5: Graduates would expertise in successful careers based on their understanding of formal and practical methods of application development using the concept of computer programming languages and designprinciples in national and international level.

ProgramOutcome(Pos): AttheendofthePGDCAprogramthelearnerwillpossessthefollowing:

1. **ComputationalKnowledge:**Understandandapplymathematicalfoundation,computinganddomainknowledge for the conceptualization of computing models from defined problems.
2. **Problem Analysis:** Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.
3. **Design/DevelopmentofSolutions:**Abilitytotransformcomplexbusinessscenariosandcontemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies
4. **ConductInvestigationsofComplexComputingProblems:**Ability todeviseandconductexperiments, interpret data and provide well informed conclusions
5. **ModernToolUsage:**Abilitytoselectmoderncomputingtools,skillsandtechniquesnecessaryfor innovative software solutions
6. **ProfessionalEthics:**Abilitytoapplyandcommitprofessionalethicsandcyberregulationsinaglobal economic environment.

7. **Project Management:** Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
8. **Societal & Environmental Concern:** Ability to recognize economic, environmental, social, health, legal, ethicalissuesinvolved in theuseof computer technologyand other consequentialresponsibilitiesrelevant to professional practice.
9. **Innovation and Entrepreneurship:** Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.
10. **Individual & Team Work:** Ability to work as a member or leader in diverse teams in multidisciplinary environment.

ProgrammeSpecificOutcomes(PSOs):

PSO1:Learnbasicsoftwarecommonlyusedinofficesetup.
PSO2:Applygoodprogrammingdesignmethodsforprogramdevelopment.
PSO3:CreatecompetentstudentstoworkinITindustry.
PSO4:AttainexcellenceintheareaofComputer Applications
PSO5:Developtechnicalwritingskillsforinformationtechnology-relatedconcepts

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NameoftheProgram/Semester:PGDCA-I	**Course:PGDCA**
Nameofthecourse:ProgramminginC++	**CourseCode:PGDCA102**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

Objective:

1. Understandingaboutobjectorientedprogramming.Gainknowledgeaboutthecapabilitytostoreinformation together in an object.
2. Understandthecapabilityofaclasstorelyuponanother class.
3. Learnhowtostoreoneobjectinsideanother object.
4. Learnuseofonemethodcanbeusedinvarietyofdifferentways.
5. Understandingtheprocessofexposingtheessentialdatatotheoutsideoftheworld
6. CreateandprocessdatainfilesusingfileI/Ofunctions.
7. Understandaboutconstructorswhicharespecialtypeoffunctions.
8. Learnhowtowritecodeinawaythatitisindependent ofanyparticulartype.

CourseOutcome:

CO1: TounderstandtheconceptsofC++andapplicationsofobject-orientedprogrammingconcepts.
CO2 : To understand the concepts of classes and objects in object-oriented programming.**CO3:**TousetheadvancedfeaturesofOOPsuchaspolymorphismandFunctionOverloading. **CO4 :** To lean the concepts of Inheritance, constructor and virtual function.
CO5: Tounderstandandimplementtemplatestocreateflexibleandreusablecode.

UNIT–I: **ContactHours:2**

Idea of Algorithm: Representation of Algorithm, Flowchart, Pseudo code with examples, Fromalgorithms to programs, source code.Programming Language, high level and low level languages, Procedural Vs Object oriented language, Object oriented programming Concepts, Advantages, Usage,object oriented language features, Introduction to various C++ compilers, C++ standard libraries, Data types, comments, main function in C++, function prototyping, default arguments and argument matching. User defined data types: enumerated types.
Classes & Objects : Classes, Structure & Classes, Union & Classes, functions , System define and library function, Inline Function, Scope Resolution operator, Static Class Members: Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment, Friend Function, Friend Classes.

UNIT–II: **ContactHours:2**

Array, Pointers References & The Dynamic Allocation Operators: Array of Objects, Pointers to Object, Type Checking C++ Pointers, The This Pointer, Pointer to Derived Types, Pointer to Class Members, References: Reference Parameter, call byreference and return byreference Passing References to Objects, Returning Reference, Independent Reference, C++ Dynamic Memory Allocation, Allocating Array, Allocating Objects, Constructor & Destructor : Introduction, Constructor, access specifiers for constructors, and instantiation, Parameterized Constructor, Multiple Constructor in A Class, Constructor with Default Argument, CopyConstructor, Destructor.

UNIT–III: **ContactHours:2**

Overloading as polymorphism: Function & Operator Overloading: Function Overloading, Overloading Constructor Function Finding the Address of an Overloaded Function, Operator Overloading: Creating A Member Operator Function, Creating Prefix & Postfix Forms of the Increment & Decrement Operation, Overloading The Shorthand Operation (I.E. +=,-= Etc), Operator Overloading Restrictions, Operator Overloading Using Friend Function, Overloading New & Delete, Overloading Some Special Operators, Overloading [ ], ( ), -, Comma Operator, Overloading << and concepts of namespaces

UNIT–IV: **ContactHours:2**

Inheritance : Base Class Access Control, Inheritance & Protected Members, Protected Base Class Inheritance, InheritingMultipleBaseClasses,Constructors,Destructors&Inheritance, WhenConstructor &DestructorFunction are Executed, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes ,Virtual Functions & Polymorphism: Virtual Function, Pure Virtual Functions, Early Vs. Late Binding.

UNIT–V: **ContactHours:2**

File I/O, use of File functions, reading and writing from File Templates and Exception Handling: Exceptionhandlingin C++, try, throw, catch sequence, multiplecatchblocks, uncaughtexceptions, catch-allexceptionhandler Templates: Reason for templates compactness and flexibility, function template examples explicit specialization, class templates, out of class definition of member functions, The C++ I/O System Basics : C++ Streams, The Basic Stream Classes, C++ Predefined Streams, Formatted I/O: Formatting Using the IOS Members, Setting The Formal Flags, Clearing Format Flags, An Overloaded Form Of Setf ( ), Using Width() Precision() and Fill(), Using Manipulators to Format I/O, Creating Your own Manipulators.

TEXT&REFERENCEBOOKS:

- HerbertSchildt,"C++Thecompletereference"-TMHPublicationISBN0-07-463880-7
- E.Balguruswamy,"C++",TMHPublicationISBN0-07-462038-x
- MKumar "ProgramminginC++",TMHPublications
- MasteringC++,"Venugopal"

CO#	COGNITIVE ABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Rememberinginprogramminginvolvesrecallingsyntax,languageconstructs, andpredefinedfunctionsinprogramming.
CO2	UNDERSTANDING	Understandinghowcodeworksthecontrolstructureslikeloopsand conditionals and how they affect program flow.
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ProgrammeSpecificOutcomes(PSOs):

PSO1:Learnbasicsoftwarecommonlyusedinofficesetup.
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NameoftheProgram/Semester:PGDCA-I	**Course:PGDCA**
Nameofthecourse:DBMSConcepts	**CourseCode:PGDCA103**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

CourseObjective:

1. Tolearnthefundamentalsofdatamodelsandtoconceptualizeanddepictadatabase
2. Toknowthefundamentalconceptsoftransactionprocessing-concurrency
3. Tounderstandtheinternalstoragestructureswhichwillhelpin physicalDBdesign.
4. TomakeastudyofSQLandrelationaldatabasedesign system usingERdiagram.Controltechniquesand recoveryprocedure.
5. TohaveanintroductoryknowledgeabouttheStorageandQueryprocessing techniques.

CourseOutcome:

CO1:Createandmaintaindatabasesandtables.
CO2:StudyfundamentalsofRecentandEmergingDatabaseSystemsinMarket.
CO3:StartupandshutdownanOracleinstanceanddatabase
CO4:Managetransactionsandlockstoensuredataconcurrencyandrecoverability.
CO5:ManipulatedatainadatabaseusingSQL.

UNIT– I: **ContactHours:2**

Traditional file processing system: Characteristics, limitations, Database: Definition, composition., Database Management system: Definition, Characteristics, advantages over traditional file processing system, Implication of Database approach, User of database, DBA and its responsibilities, Database schema ,Database languages: DDL, DML, DCL,Database utilities, Data Models, Keys: Super, candidate, primary, unique, foreign.

UNIT– II: **ContactHours:2**

Entity relationship model: concepts, mapping cardinalities, entity relationship diagram, weak entity sets, strong entity set, aggregation, generalization, converting ER diagrams to tables, Overview of Network and Hierarchical model, Relational Data model: concepts, constraints. Relational algebra: Basic operations, additional operations

UNIT– III: **ContactHours:2**

Database design: Functional dependency, decomposition, problems arising out of bad database design, normalization, multi-valued dependency. Database design process, database protection, database integrity, database concurrency: Problems arising out of concurrency, methods of handling concurrency. Data recovery, database security: Authentication, authorization, methods of implementing security.

UNIT– IV: **ContactHours:2**

Introduction to SQL ,Data Types ,Character, Char, Varchar/Varchar2,Long, Number - Column-name number, column-name number(p) - fixed point, column-name number (p,s) - floating point ,Date data type, Raw data type, Long raw data type ,LOB data type - CLOB, BLOB, BFILE, Table - Constraint definition, Domain, Entity, Referential ,Create table - Alter table, Drop table, Normalization (Applied) Commands and clause - Insert, update, delete, with where clause ,Queries and SQL functions ,Select with all options ,Operations and operators -Arithmatic, Comparison, Logical (in, out, between, like, all, %, any,exists, not exists, is null, is not null, and, or, not) Query Expression Operators - Union, intersect, minus SQL functions ,Date - Sys_date, new_time, next_day, add_month, last_day, months_between Numeric - round, trunc, abs, ceil, cos, exp, floor Character - initcap, lower, upper, trim, translate, length, char Conversion - to_char, to_date, to_number Miscellaneous - Uid, User, nvl, vsize

UNIT– V: **ContactHours:2**

Group function Avg, max, min, sum, count, Group by clause, having clauseExpression (Set operations : join) Set Operations - union, union all, intersect, minus, Relating data through join concept - Join theory, Simple join, Equi join ,Non equi join - Self join, Outer join ,Table aliases Query and sub-queries ,Introduction to object oriented database - Concept ,Object binding in Oracle - Class, Attribute, Methods, Object type, Definition, Declaring and initializing, Methods , Alter and Drop type, Views and synonyms ,Synonym - Introduction ,Object type - User definitionwith example,Create, synonyms as alias for table andview, drop, Sequence - Introduction, creates with option, alter sequence, drop ,View - into, creates, update, drop ,Index - Introduction, create,Primaryintroduction to DBA, User create, granting ,Privileges - Object, System, User (GRANT, REVOKE, COMMIT, ROLLBACK, SAVEPOINT) ,Report writer using SQL.

TEXT&REFERENCEBOOKS:

- Understanding ORACLE byPerryJ. and Later J.SQL byScott Urman ORACLE PL/SQL Programming byScott Urman
- ExpertOneonOne:OraclebyWroxPL/SQL byIvan Bayross
- Databasesystemconcept-H.KorthandA.Silberschatz,TMH
- DataBaseManagementSystem -Alexies&Mathews[Vikaspublication]
- DataBaseManagementSystem-C.J.Date[NaroshaPub.]
- DataBaseManagementSystem -JamesMatin
- PrinciplesofDatabaseSystem -Ullman
- AnIntroductiontodatabasesystems-BipinDesai,GalgotiaPublication.

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NameoftheProgram/Semester:PGDCA-I	**Course:PGDCA**
Nameofthecourse:BusinessCommunication	**CourseCode:PGDCA104**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

Objective:

1. Demonstratetheability towriteclear,concise,andprofessionalbusinessdocumentssuchasemails,memos, reports, and proposals.
2. Delivereffectiveoralpresentationsandspeecheswithclarity,confidence,andappropriatenonverbal communication.
3. Buildstronginterpersonalcommunicationskillsforworkingwithcolleagues,clients,andstakeholders.
4. Developactivelisteningskillstounderstandandrespondtotheneedsandconcernsofothers.
5. Usedigitalcommunicationtoolsandtechnologieseffectively,includingemail,videoconferencing,and collaboration platforms.
6. Analyzecomplexbusinesscommunicationchallengesanddevelopsolutions.

CourseOutcome:

CO1 : Applythelearned grammar conceptstoconstruct grammaticallyaccuratesentencesinreadingandwriting. **CO2 :** Understand the process of communication and analyze various media of communication, including oral, written, and visual communication tools

CO3: Understandthevariousfunctionsandtypesofbusinesslettersusedincorporatecommunication.

CO4: Developa strongunderstandingofbusinessmannersandetiquette,includingappropriatebehavior,courtesy, and professionalism in various business settings.

Unit-I: **ContactHours: 2.5**

FundamentalofGrammarandtheir Usage: HowtoImproveCommandover Spoken andWrittenEnglish with Stress on Noun, Verb, Tense and Adjective. Sentence Errors, Punctuation, Vocabulary Building to Encourage the Individual to Communicate Effectively, Common Errors in Business Writing.

Unit-II: **ContactHours: 2.5**

IntroductiontoBusinessCommunication:BasicFormsofCommunication, Process ofCommunication, Principlesof Effective Business Communication, 7Cs; Media of Communication: Types of Communication: Barriers of Communication (Practical exercise in communication)

Unit-III: **ContactHours: 2.5**

Business letter writing: Need, Functions and Kinds, Layout of Letter Writing, Types of Letter Writing: Persuasive Letters, Request Letters, Sales Letters, ComplaintsandAdjustments;DepartmentalCommunication:Meaning, Need and Types: Interview Letters, Promotion. Letters, Resignation Letters, News Letters, Circulars, Agenda, Notice, Office Memorandums, Office Orders, Press Release.

Unit-IV: **ContactHours: 2.5**

Business Etiquettes and Public Speaking: Business Manners. Body Language Gestures, Email and Net Etiquettes, Etiquette of the Written Word, Etiquettes on the Telephone, Handling Business Meetings; IntroducingCharacteristic, Model Speeches, Role Play on Selected Topics with Case Analysis and Real Life Experiences.

ReferenceBooks

1. Boove,C.L.,Thill,J.V.,andChaturvedi,M.,(2009)BusinessCommunicationToday,PearsonEducation.
2. MurphyandHildebrandt,(2008)EffectiveBusinessCommunication,McGrawHillEducation.
3. Krizan,A.C.Buddy,andMerrier,Patricia(2008)EffectiveBusinessCommunication,7thEdition,Cengage Learning.
4. Lesikar,(2009),BusinessCommunication:MakingConnectionsinaDigitalWorld,McGrawHillEducation.
5. McGraw,S.J.,(2008)BasicManagerialSkillsforAll,8thedition,PrenticeHallofIndia.
6. Wren&Martin,(2008),EnglishGrammarandComposition,Sultanchand&Sons.

CO#	COGNITIVE ABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Rememberingincluderememberingkeydata,facts,names,dates,andother essential detailsrelatedtobusinesscommunication,suchascompanypolicies, industry trends, or communication protocols..
CO2	UNDERSTANDING	Understandinginbusinesscommunicationgoesbeyondmerememorization. Itinvolvesgraspingthemeaningandsignificanceofinformation.
CO3	APPLYING	Applyinginvolvesthepracticalapplicationofcommunicationskillstocreate and convey messages, whether in writing, speaking, or non-verbal communication,toachievespecificbusinessobjectives.
CO4	ANALYSING	Analyzingnvolvesbreakingdowncomplexinformationandcommunication scenarios.
CO5	EVALUATING	Evaluationinvolvescriticallyreviewingcommunicationstrategies,messages, and outcomes to determine whether they meet their intended goals and how theycanbeenhancedorrefined.

1. PREAMBLE:

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2. INTRODUCTIONTOPROGRAM:

PGDCAisaoneyear longprofessionalpost-graduateprogrammefor candidateswantingtodelvedeeper intothe world of computer application development.

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3. PGDCAPROGRAMMEFOCUS:

ProgramEducationalObjective(PEOs)

PEO1: To prepare graduates who are proficient in fundamental concepts and principles of computer science and its applications, enabling them to apply this knowledge to solve real-world problems.

PEO2: To provide graduates with a strong foundation in programming languages, algorithms, data structures, software engineering, database management, and other core areas of computer science, enablingthem to design, develop, and implement software solutions.

PEO3: To prepare graduates with communication and collaboration skills to work effectively inmultidisciplinary teams, adapt to changing technological landscapes, and engage in lifelong learning.

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ProgramOutcome(Pos): AttheendofthePGDCAprogramthelearnerwillpossessthefollowing:

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4. **ConductInvestigationsofComplexComputingProblems:**Ability todeviseandconductexperiments, interpret data and provide well informed conclusions
5. **ModernToolUsage:**Abilitytoselectmoderncomputingtools,skillsandtechniquesnecessaryfor innovative software solutions
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7. **Project Management:** Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
8. **Societal & Environmental Concern:** Ability to recognize economic, environmental, social, health, legal, ethicalissuesinvolved in theuseof computer technologyand other consequentialresponsibilitiesrelevant to professional practice.
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10. **Individual & Team Work:** Ability to work as a member or leader in diverse teams in multidisciplinary environment.

ProgrammeSpecificOutcomes(PSOs):

PSO1:Learnbasicsoftwarecommonlyusedinofficesetup.
PSO2:Applygoodprogrammingdesignmethodsforprogramdevelopment.
PSO3:CreatecompetentstudentstoworkinITindustry.
PSO4:AttainexcellenceintheareaofComputer Applications
PSO5:Developtechnicalwritingskillsforinformationtechnology-relatedconcepts

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NameoftheProgram/Semester:PGDCA-II	**Course:PGDCA**
Nameofthecourse:ProgrammingUsingVB.NET	**CourseCode:PGDCA201**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

CourseObjective:

1. Develop a strongcommandof the Visual Basic .NET programminglanguage, including syntax, data types, and control structures.
2. Write,compile,anddebugVB.NETcodetocreatefunctionalsoftwareapplications.
3. Connect to databases using ADO.NET or Entity Framework to perform dataretrieval, manipulation, and storage operations.
4. Design and create user-friendlygraphical user interfaces (GUIs) for Windows applications using Windows Forms or other technologies.
5. Applysoftwaredevelopmentbestpractices,includingmodularprogramming,versioncontrol,and documentation.

CourseOutcome:

CO1: Learntheconceptsofvisual developmentandevent-driven programmingin.NET,includingmethods and events.
CO2:earnvariouscontrol flowstatements,includingconditionalandloopstatements,and utilizeMsgBoxand InputBox for user interactions.
CO3: Exploretheprinciplesofpolymorphism,interfaces, overloading,overriding,andtheuseofkeywordslike MyBase and MyClass.
CO4: Explorefilehandlingin VB.NETusingclasses fromtheSystem.IOnamespace,includingreadingand writing data from and into files.
CO5: Understandhowtoconnect todatabasesusingvarioustechniquessuchasconnections,dataadapters,and datasets. Learn to create and manipulate data with ADO.NET.

UNIT I: **ContactHours:2**

Introduction to .NET: - NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visualdevelopment & event drive Programming -Methods and events.

UNIT II: **ContactHours:2**

The VB.NET Language: - Variables -Declaring variables, Data Type of variables, Forcing variables declarations,Scope&lifetimeofavariable,Constants,Arrays,typesofarray,controlarray,Collections,

Subroutines,Functions,PassingvariableNumberofArgumentOptionalArgument,Returningvaluefrom function. Control flow statements, conditional statement, loop statement. Msgbox&Inputbox

.

UNITIII: **ContactHours:2**

Object oriented Programming: - Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers, Public Private, Projected. Overloading, Friend, Overloading Vs Overriding, Interfaces, Polymorphism, MyBase & My class keywords. Overview of OLE, Accessing the WIN32 API from VB.NET & Interfacing with office 97, COM technology, advantages of COM+, COM & .NET, Create User control, register User Control, access com components in .net application.

UNIT IV: **ContactHours:2**

Working with Forms: - Loading, showing and hiding forms, controlling One form within another. GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar.There Properties, Methods and events. OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label. Designing menus, ContextMenu, access &shorcut keys, System.io Namespace, Reading and Writing data from and into files,File class and related Methods,Stream Reader, Stream Writer , Binary Reader, Binary Writer class, File and DirectoryClasses,

UNIT V: **ContactHours:2**

Databases in VB .NET: - Database : Connections, Data adapters, and datasets, Data Reader, Connection to database with server explorer, MultipleTable Connection, CreatingCommand, Data AdapterandData Set with OLEDB and SQLDB. Display Data on data bound controls, display data on Data grid. Data binding with controlslike Text Boxes, List Boxes, Data gridetc. Navigatingdata source, Data GridView, Data form wizard, Data validation, Connection Objects, Command Objects, Data Adapters, Dataset Class, Overview of ADO,from ADO to ADO.NET, Generate Reports Using Crystal Report Viewer. Crystal Report : Connection to Database, Table, Queries Building, Report, Modifying Report, Formatting Fields and Object, Header, Footer, Details, Group Header, Group footer, Working with formula fields, Parameter fields, Group, Special fields, Working with Multiple Tables, SQL in Crystal Report, Report Temples

Text&ReferenceBooks:

1. VB.NETProgrammingBlackBookbyStevenHolzner–Dreamtech publications.
2. MasteringVB.NETbyEvangelosPetroutsos-BPBpublications.
3. Introductionto.NETframework-WroxPublication.

CO#	COGNITIVE ABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Rememberinginprogramminginvolvesrecallingsyntax,languageconstructs, andpredefinedfunctionsinprogramming.
CO2	UNDERSTANDING	Understandinghowcodeworksthecontrolstructureslikeloopsand conditionalsandhowtheyaffectprogramflow.
CO3	APPLYING	Applyinginvolvesusingyourunderstandingtowritecodetosolvespecific problems.
CO4	ANALYSING	Analyzingincludesdebuggingandtroubleshootingcodetoidentifyandfix errorsorissues.
CO5	EVALUATING	Evaluationinvolvecomparingdifferentapproachestosolvingaproblem and selectingthemost suitableonebasedoncriterialikespeed,resourceusage, and code simplicity.

1. PREAMBLE:

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PSO1:Learnbasicsoftwarecommonlyusedinofficesetup.
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NameoftheProgram/Semester:PGDCA-II	**Course:PGDCA**
Nameofthecourse:Programmingin"Python"	**CourseCode:PGDCA202**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

CourseObjective:

1. Develop a strong command ofthe Python programminglanguage, includingits syntax, data structures, and libraries.g, version control, and documentation.
2. Understandandapplytheprinciplesofobject-orientedprogramming,includingclasses,objects, inheritance, polymorphism, and encapsulation in Python.
3. Manipulateandprocessdatastoredinvariousfileformats(e.g.,textfiles,CSV,JSON).
4. UsePythonlibrariessuchasNumPy,Pandas,andMatplotlibtoanalyzeandvisualizedata.
5. Adhere to ethical coding practices and understand the importance of respecting intellectualproperty anddata privacy.

CourseOutcome:

CO1: Understand thehistory, features, and advantages of the Python programming language.**CO2:**Learnabout dictionariesin Python,includinghowtoaccessvaluesindictionaries,workwith dictionaries, and utilize dictionary properties and functions.
CO3: Understandtheconcept ofexceptions andlearnhowtohandleexceptionsusingtry, except,andfinally clauses. Explore user-defined exceptions for custom error handling.
CO4: UnderstandvariousdatastructuresinPython,includingarrays, sets, stacks, queuesandvariousdata structures in Python, including arrays, sets, stacks, and queues
CO5: Learnabout multithreadingin Python,includingstartingthreads,usingthethreadingmodule, synchronizing threads, and managing a multithreaded priority queue.

UNIT– I: **ContactHours:2**

Introduction: History,Features,Settinguppath,workingwithPython.
BasicSyntax: VariableandDataTypes,Operator.
ConditionalStatements: If,If-else,Nestedif-else
Looping: For,While,NestedloopsControlStatements:Break,Continue,AndPass.
StringManipulation: AccessingStrings,BasicOperations,Stringslices,FunctionandMethods.
Lists: Introduction,Accessinglist,Operations,Workingwithlists,FunctionandMethods.
Tuple: Introduction,Accessingtuples,Operations,Working,FunctionsandMethods

UNIT– II: **ContactHours:2**

Dictionaries: Introduction, Accessing values in dictionaries, working with dictionaries, Properties Functions
Functions: Definingafunction callinga function Types offunctionsFunction Arguments Anonymous functions Global and local variables

Modules: ImportingmoduleMathmoduleRandommodulePackagesComposition
Input-Output: Printing onscreenReading data from keyboard Opening and closing file Reading and writing files Functions

UNIT– III: **ContactHours:2**
ExceptionHandling: Exception,ExceptionHandlingExceptclauseTry?FinallyclauseUserDefined Exceptions
OOPsconcept: ClassandobjectAttributesInheritanceOverloadingOverridingDatahiding
Regularexpressions: MatchfunctionSearchfunctionMatchingVSSearchingModifiersPatterns

UNIT– IV: **ContactHours:2**
Datastructures:arrays,set,stacksandqueues.Searchingandsorting:linearandbinarysearch,bubble, selection and insertion sorting.

UNIT– V: **ContactHours:2**
Thread: StartingathreadthreadingmoduleSynchronizingthreadsMultithreadedPriorityQueue
GUIProgramming: IntroductionTkinterprogrammingTkinterwidgets

TextBooks:

1. ThinkPython:Themostbasicofthislist,ThinkPythonprovidesacomprehensivePythonreference.
2. Fluent Python: While Python's simplicity lets you quickly start coding, this book teaches you how towrite idiomatic Python code, while going into several deep topics of the language.
3. EffectivePython:59WaystoWriteBetterPython:Thisrelativelyshortbookisacollectionof59 articles that, similarly to Fluent Python, focus on teaching you how to write truly Pythonic code.
4. Python Cookbook: Asa cookbook, thiswillbea goodreferenceonhowtousePython tocompletetasks you have done in another language.

ReferenceBooks:
Head-FirstPython,2ndeditionPaulBarry(O'Reilly,2016).

CO#	COGNITIVE ABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Rememberinginprogramminginvolvesrecallingsyntax,languageconstructs, and predefined functions in programming.
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NameoftheProgram/Semester:PGDCA-II	**Course:PGDCA**
Nameofthecourse:Webtechnologyand Multimedia	**CourseCode:PGDCA203**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

CourseObjective:

1. Developastrongcommandofwebtechnologies,includingHTML,CSS,JavaScript,andserver-side scripting languages.
2. Createmultimediacontent,includinggraphics,images,audio,andvideo,usingappropriatesoftwaretools.
3. Implementinteractiveelementstoenhancetheuserexperienceonwebapplications.
4. Integratemultimediaelements(e.g.,images,videos,animations)seamlesslyintowebapplications.
5. Plan,design,develop,anddeploycompletewebprojects,includingwebsitesandwebapplications.

CourseOutcome:

CO1: StudentswillgainanunderstandingofweB-relatedconceptsandHTML.
CO2: Understand the concept of tables,frames and forms in web design
CO3: Introduce students to JavaScript,JavaScript objects and their usage
CO4: LearnaboutmultimediatypeS,MIDIBasicConceptsandAnimation. **CO5:**
To learn the basics of Flash animation and Adobe photoshop.

UNITI: **ContactHours:2**

WebPages; Hyper Text Transfer Protocol (HTTP); File Transfer Protocol (FTP) Domain Names; URL,Website, Web browser, Web Servers; Basic Tags of HTML: HTML, HEAD, TITLE, BODY, Heading tag (H1 to H6) and attributes,FONT tag and Attributes, P, BR, Comment in HTML (<! >), Formatting Text(B, I, U, EM,BLOCKQUOTE,PREFORMATTED,SUB,SUP,STRIKE),OrderedList-OLUnorderedList,
ADDRESS Tag;Creating Links: Link to other HTML documents or data objects, Links to other places in the same HTML documents, Linkstoplaces in other HTML documents; AnchorTag<AHREF> and<ANAME>, Inserting ImagesImage Link, Horizontal Rules <HR ALIGN, WIDTH, SIZE, NOSHADE>;

UNITII: **ContactHours:2**

Tables:CreatingTables,Border,TH,TR,TD,CELLSPACING,CELLPADDING,WIDTH,COLSPAN,
CAPTION, ALIGN, CENTER;Frames: Percentage dimensions, Relative dimensions, Frame – Src,Frameborder, height and width, Creating two or more rows Frames <FRAMESET ROWS >, Creating two or morePage 3 Columns Frames <FRAMESET COLS >, <FRAME NAME SRC MARGINHEIGHT MARGINWIDTH SCROLLING AUTO NORESIZE>, <NOFRAMES>, </NOFRAMES>; Forms: Definition, FormTags:FORM, <SELECT NAME,SIZE,MULTIPLE /SINGLE><OPTION></SELECT>,<TEXTAREA NAME ROWS COLS > , </TEXTAREA>, METHOD,CHECKBOX, HIDDEN, IMAGE, RADIO, RESET, SUBMIT, INPUT <VALUE, SRC,CHECKED, SIZE, MAXLENGTH, ALIGN>;

UNIT III: **ContactHours:2**

JavaScript Introduction, Variable declaration, Operators, Control, Statements, Error Handling, Understanding arrays, Function Declaration, Built In Functions, Standard Date and Time Functions, Working with Objects,Call method in JavaScript, Inheritance in JavaScript using prototype.

UNITIV: **ContactHours:2**

Introduction to Multimedia: types of Multimedia, hardware and software requirement,Multimedia Operating System , Applications, MIDIBasicConcepts, MIDIDevices, MIDIMessages, VideoandAnimation,Computer Based Animation,Animation principles, Methods of controlling Animation, Display of Animation,Transmission of Animation

UNITV: **ContactHours:2**

Learn the basic of flash animation, creating a new movie, animate text, drawing and painting tools , creating layers motion twinning, shape twining, mask layers, importing sound, the photoshop workspaceuse of menus palettes and toolbox, creating new images, using selecting tools, lasso tool Direct select lasso, convert pointtool, image adjustment through Photoshop.

TextBooks:

1. FLASHMXBible–Robert Reinhart
2. SamsTeachYourselfMacromediaFlash8in24hrs–PhillipKerman
3. PhotoshopBible–WilleyPublication
4. MultimediaMakingitworks–TayVaughanTataMcgrawHills
5. IntroductiontoHTML-KamleshNagrawal
6. IntroductiontowebandDHTML–IvanBayross

CO#	COGNITIVE ABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Rememberinginprogramminginvolvesrecallingsyntax,languageconstructs, andpredefinedfunctionsinprogramming.
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PEO5: Graduates would expertise in successful careers based on their understanding of formal and practical methods of application development using the concept of computer programming languages and designprinciples in national and international level.

ProgramOutcome(Pos): AttheendofthePGDCAprogramthelearnerwillpossessthefollowing:

1. **ComputationalKnowledge:**Understandandapplymathematicalfoundation,computinganddomainknowledge for the conceptualization of computing models from defined problems.
2. **Problem Analysis:** Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.
3. **Design/DevelopmentofSolutions:**Abilitytotransformcomplexbusinessscenariosandcontemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies
4. **ConductInvestigationsofComplexComputingProblems:**Ability todeviseandconductexperiments, interpret data and provide well informed conclusions
5. **ModernToolUsage:**Abilitytoselectmoderncomputingtools,skillsandtechniquesnecessaryfor innovative software solutions
6. **ProfessionalEthics:**Abilitytoapplyandcommitprofessionalethicsandcyberregulationsinaglobal economic environment.

7. **Project Management:** Ability to understand management and computing principles with computing knowledge to manage projects in multidisciplinary environments.
8. **Societal & Environmental Concern:** Ability to recognize economic, environmental, social, health, legal, ethicalissuesinvolved in theuseof computer technologyand other consequentialresponsibilitiesrelevant to professional practice.
9. **Innovation and Entrepreneurship:** Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.
10. **Individual & Team Work:** Ability to work as a member or leader in diverse teams in multidisciplinary environment.

ProgrammeSpecificOutcomes(PSOs):

PSO1:Learnbasicsoftwarecommonlyusedinofficesetup.
PSO2:Applygoodprogrammingdesignmethodsforprogramdevelopment.
PSO3:CreatecompetentstudentstoworkinITindustry.
PSO4:AttainexcellenceintheareaofComputer Applications
PSO5:Developtechnicalwritingskillsforinformationtechnology-relatedconcepts

FACULTYOFINFORMATIONTECHNOLOGY
KALINGA UNIVERSITY
RAIPUR

NameoftheProgram/Semester:PGDCA-II	**Course:PGDCA**
Nameofthecourse:DataStructures WebtechnologyandMultimedia	**CourseCode:PGDCA204**
TotalMarksforEvaluation:100 Internal Marks: 70 ExternalMarks:30	**NoofContactHours: 10**

CourseObjective:

1. Develop expertise in creating and editing multimedia content, including graphics, images, audio,video, and animations.
2. Demonstrate a strong command of web technologies, including HTML, CSS, JavaScript, and server-side scripting languages.
3. Buildinteractiveandfeature-richwebapplicationsusingfront-endandback-enddevelopment technologies.
4. Establishconnectionsbetweenwebapplicationsanddatabasesfordataretrieval,storage,and manipulation.
5. Create andeditdigital mediacontent,including audio,video,and animations,forwebandmultimedia projects.

CourseOutcome:

CO1: Studentswill understandtherepresentation ofsingleandmultidimensionalarrays, includingthe concepts of indexing and accessing array elements.
CO2: Studentswillbeintroducedtotheconceptsofstacksandqueues,includingtheirprimitiveoperations.
CO3: Tolearntheconceptsoflinkedlistsandbinarytrees
CO4: Understandtheconceptofmultilevelindexingasanefficientapproachtotreeindexes.
CO5: Learnaboutlinearsearch,binarysearch,andhashingasfundamentalsearchingtechniques.

UNIT-I: **ContactHours:2**

Arrays: Representation of single and multidimensional arrays; sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices.

UNIT-II: **ContactHours:2**

Stacks and Queues: Introduction and primitive operations on stack; Stack application: Infix, postfix,prefix expressions; Evaluation of postfix expression; Conversion from infix to postfix. Introduction and primitive operation on queues, D-queues and priority queues.

UNIT-III: **ContactHours:2**

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, two way lists and Use of headers.
Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion;

UNIT-IV: **ContactHours:2**

Multilevel indexing and B-Trees: Introduction: The invention of the B-tree; Statement of the problem; Indexingwithbinarysearchtrees; Multilevel indexing, a better approachtotreeindexes; B-trees: working up from the bottom; Example for creating a B-tree.

UNIT-V: **ContactHours:2**

SortingTechniques:Insertionsort, selectionsort, mergesort,heapsort.
Searching Techniques: linear search, binary search and hashing

TextBooks:

1. E.HorowitzandS.Sahani,"FundamentalsofDataStructures",GalgotiaBooksourcePvt.Ltd,2003.
2. R.S.Salaria,"DataStructure&Algorithms", Khanna BookPublishingCo. (P)Ltd.,2002.

CO#	COGNITIVE ABILITIES	COURSEOUTCOMES
CO1	REMEMBERING	Rememberinginprogramminginvolvesrecallingsyntax,languageconstructs, andpredefinedfunctionsinprogramming.
CO2	UNDERSTANDING	Understandinghowcodeworksthecontrolstructureslikeloopsand conditionalsandhowtheyaffectprogramflow.
CO3	APPLYING	Applyinginvolvesusingyourunderstandingtowritecodetosolvespecific problems.
CO4	ANALYSING	Analyzingincludesdebuggingandtroubleshootingcodetoidentifyandfix errorsorissues.
CO5	EVALUATING	Evaluationinvolvecomparingdifferentapproachestosolvingaproblem and selectingthemost suitableonebasedoncriterialikespeed,resourceusage, and code simplicity.

1. PREAMBLE:

This one year Post Graduate Diploma in Computer Applications (PGDCA) course aims to give adequate expertise to a student to enable him/her to utilize computers for maximum benefit in an Office or Business environment. It will also enable a student to develop programs of his/her own to enhance productivityin such an environment. It will provide the necessary skills to make the successful candidates proficient in software development, paving the way for self-employment. The course is oriented more towards Programming and Software than to Hardware.

2. INTRODUCTIONTOPROGRAM:

PGDCAisaoneyear longprofessionalpost-graduateprogrammefor candidateswantingtodelvedeeper intothe world of computer application development.

This programme is designed to provide higher level education in Information Technologies. Graduates of Arts, Science, Management &Commerce stream whowishtomake along-term careerin InformationTechnologycan choose this course and have requisite strong foundation forpursuing masters in Information Technology. It is also helpful to students who want to pursue higher studies from Universities.

The Programme prepares the students to seek compatible job opportunities in the industry as well as make them readyto pursuemaster's programmein IT. Theapproach is to preparestudents from diverse fields in developing skills related to programming and understanding the concepts related to Computers and its applications. The programme is designed to develop the coding and analytical ability of the students.

3. PGDCAPROGRAMMEFOCUS:

ProgramEducationalObjective(PEOs)

PEO1: To prepare graduates who are proficient in fundamental concepts and principles of computer science and its applications, enabling them to apply this knowledge to solve real-world problems.

PEO2: To provide graduates with a strong foundation in programming languages, algorithms, data structures, software engineering, database management, and other core areas of computer science, enabling them to design, develop, and implement software solutions.

PEO3: To prepare graduates with communication and collaboration skills to work effectively inmultidisciplinary teams, adapt to changing technological landscapes, and engage in lifelong learning.

PEO4: To equip graduates with ethical and professional values, enabling them to make ethical and responsible decisions, understand the impact of their work on society, and contribute positivelyto the community.

PEO5: Graduates would expertise in successful careers based on their understanding of formal and practical methods of application development using the concept of computer programming languages and designprinciples in national and international level.

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