

**Post Graduate Diploma in Computer Application (PGDCA) SEMESTER-II**  
**With Effective from December – 2023**

Programme Outcome(PO) -For PGDCA Programme	The objective of the PGDCA programme is to prepare students for a career in IT support as well as software development by training them in the core and emerging areas of computer applications to satisfy the needs of the society, industry, academic institutions and government.
Programme Specific Outcome (PSO)-For PGDCA Semester- II	The objective of the PGDCA programme is to prepare students for a career in IT support as well as software development by training them in the core and emerging areas of computer applications to satisfy the needs of the society, industry, academic institutions and government.

To Pass	1. At least 40% Marks in the External Examination in each paper and 2. At least 40% Marks in the individual lead of passing or 33% marks in aggregate at the internal tests conducted by the Department /PG Centre.
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Course Type	Course Code	Name Of Course	Theory/ Practical	Credit	Exam Duration In hrs	Component of Marks		
						Int	Ext	Total
						Total	Total	Total
Core Course	PGDCA02C01	Fundamentals of AI	T	4	3	30/12	70/28	100
	PGDCA02C02	Data Communication & Networking	T	4	3	30/12	70/28	100
	PGDCA02C03	Object Oriented Programming	T	4	3	30/12	70/28	100
	PGDCA02C04	.Net Technology	T	4	3	30/12	70/28	100
	PGDCA02C05	Web Application Development	T	4	3	30/12	70/28	100
	PGDCA02C06	Practicals	P	5	3	30/12	70/28	100

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GUJARAT INSTITUTIONAL RATING FRAMEWORK (4 STAR)

AAA Reaccredited CGPA 3.56 – GRADE **A<sup>+</sup>** KCG Dept of Edu. Govt of Gujarat-April 2017

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Syllabus as per NEP 2020 with effect from the Academic Year 2023-2024

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**PGDCA (Post Graduate Diploma in Computer Applications)**

**Semester-II**

<b>Course Code</b>	<b>PGDCA02C01</b>	<b>Title of the Course</b>	<b>Fundamentals of AI</b>
<b>Total Credits Of the Course</b>	<b>4</b>	<b>Hours per Week</b>	<b>4</b>

Course Objectives:	<ul style="list-style-type: none"><li>• To introduce the term Artificial Intelligence and its related domains.</li><li>• To study basic concepts related to expert systems.</li><li>• To learn various search methods.</li><li>• To understand various knowledge representation methods.</li><li>• To introduce various application areas of AI such as Natural Language Processing, game playing, and robotics.</li></ul>
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Course Content		
Unit	Description	Weightage*(%)
1.	<b>Introduction to AI</b> <ul style="list-style-type: none"><li>- Concepts and Definitions of AI</li><li>- Goals and Application of Artificial Intelligence</li><li>- Advantages&amp; Disadvantages of Artificial Intelligence</li><li>- Types of Artificial Intelligence</li><li>- Agents in Artificial Intelligence</li><li>- Task Classification of AI</li></ul>	25%
2.	<b>Expert Systems</b> <ul style="list-style-type: none"><li>- Introduction</li><li>- Characteristics of Expert System</li><li>- Representing and Using Domain knowledge</li><li>- General Structure of Expert Systems</li><li>- Expert System Shell</li><li>- Advantages and Disadvantages of Expert system</li></ul>	25%
3.	<b>Introduction to AI techniques and Application Areas</b> <ul style="list-style-type: none"><li>- Introduction to Basic search strategies: Some examples and Classification</li><li>- Introduction to Heuristic Search technique: Depth First Search</li><li>- Using Predicate Logic</li><li>- Representing simple facts in logic, video, embedding sound clips.</li></ul>	25%

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4.	<b>Trends in AI</b> <ul style="list-style-type: none"> <li>- Introduction to Fuzzy logic</li> <li>- Introduction to various application areas of AI like: Natural Language Processing, Game Playing, Robotics</li> <li>- Introduction to Machine Learning</li> <li>- Types of Machine Learning(Supervise and Unsupervised, Semi supervise)</li> <li>- Fuzzification, Defuzzification, Reinforcement Learning(Chat GPT)</li> </ul>	25%
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Teaching-Learning Methodology	Blended learning approach in cooperating traditional classroom teaching and online / ICT - based teaching practices.
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Evaluation Pattern		
Sr.No.	Details of the Evaluation	Weightage(%)
1.	Internal Written / Practical Examination	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	15%
3.	External Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	The term Artificial Intelligence and its related domains.
2.	Basic concepts related to expert systems.
3.	Various search methods.
4.	Various knowledge representation methods.
5.	Various application areas of AI such as Natural Language Processing, game playing, and robotics.

Suggested References:	
Sr.No.	References
1.	Elain Rich: Artificial Intelligence, McGraw Hill, 2001.
2.	Patterson, Dan W: Introduction to Artificial Intelligence, Prentice Hall of India (PHI).

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3.	R.Akerkar : Introduction to Artificial Intelligence, PHI, 2005
4.	S. Russell and P. Norvig, Modern Approach to Artificial Intelligence, Prentice Hall of India Ltd., 2006
5.	George Luger, Artificial Intelligence, 5th Edition, Addison Wesley, 2004.

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**PGDCA (Post Graduate Diploma in Computer Applications)**

**Semester-II**

<b>Course Code</b>	<b>PGDCA02C02</b>	<b>Title of the Course</b>	<b>Data Communication &amp; Networking</b>
<b>Total Credits Of the Course</b>	<b>4</b>	<b>Hours per Week</b>	<b>4</b>

Course Objectives:	<ol style="list-style-type: none"> <li>1. Data communication fundamentals.</li> <li>2. Protocol hierarchies, reference models and transmission techniques.</li> <li>3. Local network technology.</li> <li>4. Basics of the Internet.</li> </ol>
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Course Content		
Unit	Description	Weightage*(%)
1.	<b>Introduction and Data Communication Fundamentals</b> – Computer Networks – definition and advantages – Transmission Technology Broadcast Networks, Point-to-Point Networks – Introduction to Local Area Networks, Metropolitan Area Networks, Wide Area Networks – Transmission Media – Guided and Unguided – The Theoretical basis for data communication	25%
2.	<b>Protocol Hierarchies, Reference Models and Transmission Techniques</b> – Protocol Hierarchies, Design Issues for the Layers – The OSI Reference Model – The TCP/IP Reference Model – Multiplexing – Circuit Switching, Message Switching, and Packet Switching Techniques	25%
3.	<b>Local Network Technology</b> - Local Area Network Topologies and Characteristics - Carrier Sense Multiple Access Protocols - Introduction to Gigabit Ethernet(GbE), Wi-Fi, Bluetooth - Network devices	25%

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4.	<b>The Internet</b> – Introduction to World Wide Web – Electronic Mail – Architecture and Services – Domain Name System(DNS), The DNS Name Space, Name Servers, URL – Introduction to Satellite Networks , Geosynchronous Satellites , Medium-orbit satellites, Low-Orbit Satellite	25%
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Teaching-Learning Methodology	Blended learning approach in cooperating traditional classroom teaching and online/ICT-based teaching practices..
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Evaluation Pattern		
Sr.No.	Details of the Evaluation	Weightage(%)
1.	Internal Written/Practical Examination	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	15%
3.	External Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand data communication fundamentals.
2.	Understand protocol hierarchies, reference models and transmission techniques.
3.	Understand local network technology.
4.	Understand basics of the Internet.

Suggested References:	
Sr.No.	References
1.	Tanenbaum A. S. : Computer Networks, Prentice-Hall of India Ltd., New Delhi, 1997.
2.	Forouzan B. A.: Data Communications and Networking, 4th Edition, Tata McGrawHill, 2017.
3.	Stallings W.: Data and Computer Communications, Pearson Education India; 9th Edition (2013).

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**PGDCA (Post Graduate Diploma in Computer Applications)**

**Semester-II**

<b>Course Code</b>	<b>PGDCA02C03</b>	<b>Title of the Course</b>	<b>Object Oriented Programming</b>
<b>Total Credits Of the Course</b>	<b>4</b>	<b>Hours per Week</b>	<b>4</b>

Course Objectives:	<ol style="list-style-type: none"> <li>1. To provide basic understanding of logical organization and architecture of a computer.</li> <li>2. To impart fundamental knowledge on processors, memory, input/output, instructions and flow of control.</li> <li>3. To introduce fundamental concepts related to gates and logic circuits used in a digital computer.</li> </ol>
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Course Content		
Unit	Description	Weightage *(%)
1.	<b>Basic Java Programming Concepts</b> <ul style="list-style-type: none"> <li>- Structure of Java Program</li> <li>- Concept of Bytecodes and platform independence</li> <li>- Primitive Data Types, Variable Names, Scope, Operators, Expressions - Control Flow Statements</li> <li>- Arrays</li> </ul>	25%
2.	<b>Constructors and Access specifiers</b> <ul style="list-style-type: none"> <li>- Constructor, Constructor Overloading</li> <li>- Method Overloading, Passing and Returning object form</li> <li>- New operator, this and static keyword, finalize() method</li> <li>- Access - Control Modifiers, Nested class, Inner class</li> </ul>	25%
3.	<b>Inheritance &amp; Interface</b> <ul style="list-style-type: none"> <li>- Inheritance and its types</li> <li>- Use of Inheritance, Inheriting Data members and Methods, Method Overriding</li> <li>- Constructor in inheritance</li> <li>- Abstract(Method &amp; Class)</li> <li>- Final (Variable, Class &amp; Method)</li> <li>- Interfaces</li> <li>- Creation and Implementation of an interface</li> </ul>	25%

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4.	<b>Exception handling &amp; Applet</b> <ul style="list-style-type: none"> <li>- Try catch block, Multiple try-catch, finally block</li> <li>- Applet &amp; Life cycle</li> <li>- Applet Skeleton</li> <li>- Applet Components</li> <li>- Label, Button, Choice, List, Textfield, Checkbox</li> </ul>	25%
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Teaching-Learning Methodology	Blended learning approach incorporating traditional classroom teaching and online/ICT-based teaching practices.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage(%)
1.	Internal Written / Practical Examination	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	15%
3.	External Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understanding of the basic programming concepts and necessary constructs of the Java programming language.
2.	Understanding of the fundamental concepts of object-oriented programming using Java.
3.	Ability to describe exception handling and Input Output Management.

Suggested References:	
Sr.No.	References
1.	Programming with Java- A Primer by E. Balaguruswami, 3rd Edition, and TMH Publication.
2.	The Complete Reference – Java 2 7th Edition Herbert Schildt . TMH Publication.
3.	Saba Zame, Handbook of Object technology, CRC Press, Washington DC, 1999.

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**PGDCA (Post Graduate Diploma in Computer Applications)**

**Semester-II**

<b>Course Code</b>	<b>PGDCA02C04</b>	<b>Title of the Course</b>	<b>.Net Technology</b>
<b>Total Credits Of the Course</b>	<b>4</b>	<b>Hours per Week</b>	<b>4</b>

Course Objectives:	<ul style="list-style-type: none"> <li>• .NET Technology and its architecture.</li> <li>• Basics of C#.NET.</li> <li>• ObjectOrientedProgrammingusingC#.NET.</li> <li>• DatabaseprogrammingusingADO.NET.</li> <li>• FundamentalsofWebapplicationdevelopmentusingASP.NET.</li> </ul>
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Course Content		
Unit	Description	Weightage*(%)
1.	<b>The .NET Technology</b> <ul style="list-style-type: none"> <li>- Introduction to .NET Framework</li> <li>- Architecture of .NET framework – BCL (Base Class Library), CLR (Common Language Runtime), etc.</li> <li>- Types of applications supported by .NET Technology</li> <li>- .NET Languages–introduction</li> <li>- JIT(Just In Time) Compiler</li> </ul>	25%
2.	<b>C#.NET-I</b> <ul style="list-style-type: none"> <li>- C#.NET– Introduction and features</li> <li>- General structure of C# .NET program</li> <li>- User interface development using Windows Forms (Basic GUI controls)</li> <li>- C# .NET –basic data types, variable, constant</li> <li>- C#.NET–statements (conditional and looping)</li> <li>- Type Conversion-Boxing and Unboxing</li> <li>- Console based programs</li> </ul>	25%
3.	<b>C#.NET-II</b> <ul style="list-style-type: none"> <li>- Class fundamentals, OOPS concepts</li> <li>- Arrays, Lists, Exception handling,</li> <li>- Database programming (insert, update, delete Operation)</li> <li>- ADO.NET (architecture, connected and disconnected mode)</li> <li>- Generating reports</li> </ul>	25%

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4.	<b>ASP.NET</b> <ul style="list-style-type: none"> <li>- Introduction to ASP.NET</li> <li>- ASP.NET Web Application Project–introduction, creation</li> <li>- ASP.NET Web form - introduction, creating web forms</li> <li>- ASP.NET Page–layout, lifecycle</li> <li>- ASP.NET Controls - adding server controls to a Web Form, adding event procedures to Web Server Controls</li> <li>- Creating Master Pages</li> </ul>	25%
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Teaching-Learning Methodology	Blended learning approach incorporating traditional classroom teaching and online/ICT-based teaching practices.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage(%)
1.	Internal Written / Practical Examination	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	15%
3.	External Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand .NET Technology and its architecture.
2.	Understand basics of C#.NET.
3.	Understand Object Oriented Programming using C#. NET.
4.	Understand database programming using ADO.NET.
5.	Understand fundamentals of web application development using ASP.NET.

Suggested References:	
Sr. No.	References
1.	C#2010Programmingcovers.NET4.0, Black Book, Dream tech Press.
2.	BeginningMicrosoftVisualC#2008, Wrox Publication.
3.	C#4.0inaNutshell, Authors: Joseph Alabari & Ben Alabari, O'Reilly.
4.	Documentation of relevant software packages.

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**PGDCA (Post Graduate Diploma in Computer Applications)**

**Semester-II**

<b>Course Code</b>	<b>PGDCA01C05</b>	<b>Title of the Course</b>	<b>Web Application Development</b>
<b>Total Credits Of the Course</b>	<b>4</b>	<b>Hours per Week</b>	<b>4</b>

Course Objectives:	1. To introduce students to Web browsers and basics of HTML. 2. To introduce students to Web page designing using HTML. 3. To introduce students to basics of JavaScript.
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Course Content		
Unit	Description	Weightage*(%)
1.	<b>Web Browsers and HTML Editors</b> - Introduction to web browsers, Client server technology - Basics of HTTP, HTML, URL and IP Addresses. - HTML editors (Macromedia Dream viewer, Microsoft Visual studio, Net beans etc.) with their different styling tools and uses. - Creation of sample HTML document using different HTML editors.	25%
2.	<b>Web Page Designing-I</b> - HTML Generator - HTML Documentation, Tag, Links and Examples - Manipulating Header, footer, Colours, Comments, Alignment, Paragraph, Tab, Images and Pictures - Order and Unordered Lists, Nested Lists	25%
3.	<b>Web Page Designing-II</b> - Tables Formatting and Editing Features - Defining different Styles, In-line, Internal, External Style Sheets, Linking of Sheets in HTML Documents, Working with Multiple Styles. - Definition of Frames, Framesets, Nested Framesets - Action, Method, Enctype attributes of Forms, Drop down lists and examples	25%
4.	<b>JavaScript &amp; HTML-5</b> - Introduction to JavaScript, uses and applications - Syntax, functions, comments, variables, operators with examples - Dates, string and array with example. - Case study (Creation of sample web site with JavaScript and DHTML) - Introduction to HTML5 and its elements	25%

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Teaching-Learning Methodology	Blended learning approach in cooperating traditional classroom teaching and online / ICT - based teaching practices.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage(%)
1.	Internal Written / Practical Examination	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	15%
3.	External Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand Web browsers and basics of HTML.
2.	Understand Web page designing using HTML.
3.	Understand basics of JavaScript.

Suggested References:	
Sr. No.	References
1.	Xavier C : World Wide Web Design With HTML, Tata McGraw Hill Publication, 2000.
2.	Beginning JavaScript Fifth Edition by Jeremy McPeak and Paul Wilton, Wrox Publication, 2017.
3.	Douglas E Commerce: The Internet, PHI, Second Edition, May 2000.
4.	Manuals of Suitable Packages.
5.	HTML 5 Black Book by DT Editorial Services, Dreamtech Press Publication.

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**PGDCA (Post Graduate Diploma in Computer Applications)**

**Semester-II**

Course Code	PGDCA02C06	Title of the Course	Practicals
Total Credits Of the Course	<b>5</b>	Hours per Week	<b>10</b>

Course Objectives:	<ol style="list-style-type: none"> <li>1. To enable students to apply knowledge of Object Oriented Programming using Java language.</li> <li>2. To enable students to apply knowledge of C#.NET and ASP.NET.</li> <li>3. To enable students to apply knowledge HTML and JavaScript.</li> </ol>
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Course Content	
Description	Weightage*(%)
Part-1:Practicalbasedon <b>PGDCA02C03</b>	30%
Part-2:Practicalbasedon <b>PGDCA02C04</b>	35%
Part-3:Practicalbasedon <b>PGDCA02C05</b>	35%

Teaching-Learning Methodology	Hands on training and programming using computer.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage(%)
1.	Internal Written / Practical Examination	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance	15%
3.	External Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Develop programs using Java programming language. 2. develop window
2.	Develop programs using Java programming language. 2. develop window
3.	Develop website using HTML and JavaScript.

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