



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P1S02CDCA01	Object Oriented Programming with Java	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain the fundamentals of Java programming, including its history, features, program structure, bytecode concept, and execution environment (JDK/JRE).

CLO2: Apply basic programming constructs in Java such as data types, variables, operators, control flow statements, arrays, and input handling using the Scanner class.

CLO3: Demonstrate object-oriented programming concepts by designing classes and objects, and implementing constructors, methods, inheritance, polymorphism, and access control mechanisms.

CLO4: Analyze and implement advanced object-oriented features including interfaces, abstract classes, enumerations, inner classes, and exception handling techniques.

CLO5: Develop Java applications using utility packages, collections framework, multithreading, file handling (I/O), and basic graphics programming.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Basic Java Programming Concepts: - The Java programming language: history, evolution, features - Introduction to the Java programming environment, JDK, JRE - Structure of Java Program - Concept of Bytecodes and platform independence - Primitive Data Types, Variable Names, Scope, Operators, Expressions Control Flow Statements - Arrays, Scanner class - Wrapper classes, automatic boxing and unboxing	Classroom Lectures (CL), ICT-Enabled Learning, Self-Directed Learning, Collaborative Learning, Problem-Based Learning	CLO1, CLO2
II	Introduction to Object-oriented Programming: - Class: Introduction and Definition, Declaration, class body - Object: Declaring, Instantiating and Initialising an Object - Method, Constructor - new operator, this and static keyword - finalize() method, Access - Control Modifiers - Inheritance and polymorphism - Method Overloading and Method Overriding - Inheritance analogy in Guru-Shishya parampara - Localization and multilingual systems for Indian languages	Classroom Lectures, Problem-Based Learning, Collaborative Learning, Simulation & Role-Play (e.g., Guru-Shishya analogy), ICT-Enabled Learning, Reflective Practices	CLO2, CLO3



SARDAR PATEL UNIVERSITY

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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

III	Object-Oriented Features and Exception Handling and Multithreading: - Interfaces - Final and abstract classes, abstract methods - Enumeration - Inner classes and anonymous classes - Exception handling - Multithreading	Classroom Lectures, Problem-Based Learning, Case-Based Learning (exception scenarios), Collaborative Learning, Research-Oriented Learning, ICT-Enabled Learning	CLO3, CLO4
IV	Java Utility Packages, input-output and Collections: - Packages - The collections framework - Input-output - Introduction to the Graphics class	Classroom Lectures, Problem-Based Learning, System Development Projects, Experiential Learning, ICT-Enabled Learning, Collaborative Learning	CLO4, CLO5

- **Assessment Methodologies**

(A) Internal Assessment

a. Internal Formative assessment (20 Marks)

- Assignment, Self-learning and Term work
- Seminar / Presentation
- Quizzes

b. Internal Summative Assessment (30 Marks)

- Mid-term Test

(B) External Examination (50 Marks)

a. Term-end Examination



SARDAR PATEL UNIVERSITY

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NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

(C) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1, CLO2	30	4	5	3	12
II	CLO2, CLO3	30	3	5	5	13
III	CLO3, CLO4	25	2	4	4	10
IV	CLO4, CLO5	35	2	5	8	15
		120	11	19	20	50

• Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity, Internal test	50
2	End-Semester Examination	Written Exam	50

(D) CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	1	-	-	2	1	-	-	1
CLO2	3	3	2	-	-	2	1	-	-	1
CLO3	3	3	3	1	-	2	1	1	-	2
CLO4	3	3	3	1	-	2	1	1	1	2
CLO5	3	3	3	2	1	3	1	2	1	3

• Suggested Learning Materials Books:

Sr. No.	Title	Author(s)	Edition/Year	Publisher
1	Java: The Complete Reference	Herbert Schildt	11 th Edition, 2018	McGraw-Hill
2	Basic Java Programming Concepts	E. Balagurusamy	7 th Edition, 2017	McGraw Hill Education
3	Java Utility Packages, Collections and Multithreading	Kathy Sierra, Bert Bates	2 nd Edition, 2008	O'Reilly Media
4	Core Java: Volume I – Fundamentals	Cay S. Horstmann	11 th Edition, 2019	Prentice Hall

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	e-PGPathshala	https://inflibnet.ac.in
2	Official Java Documentation by Oracle Corporation	https://docs.oracle.com/javase/tutorial/
3	Free interactive Java course on Codecademy	https://www.codecademy.com/learn/learn-java
4	Java for Beginners to Advanced	https://www.tutorialspoint.com/java/index.htm
5	IKS Division, Ministry of Education	https://iksindia.org



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P1S02CDCA02	Web Application Development	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain fundamentals of web technology, client-server architecture, and web terminologies.

CLO2: Develop structured web pages using HTML5 with semantic elements, forms, and multimedia.

CLO3: Apply CSS3 for styling, layouts, and responsive web design.

CLO4: Use JavaScript for client-side scripting with basic programming constructs.

CLO5: Create interactive web pages using DOM manipulation, events, and form validation.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Fundamentals of Web Technology - Evolution of Web Technology - Client-Server Architecture - Web Terminologies: Web Page, Web Server, Browser, URL, etc. - Types of Websites and Web Applications	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO1
II	Hyper Text Markup Language - Introduction to HTML5 and Structure of HTML5 Document - Elements, Attributes, Headings, Paragraphs and Comments - Text Formatting Tags, Tables and their elements - Lists, Hyperlinks, and Images - Semantic Elements - Forms and Input Types	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO2
III	Cascading Style Sheet - CSS Syntax and Selectors - Box Model and Positioning - Flexbox and Grid Layout - Responsive Web Design (Media Queries) - CSS Transitions and Animations	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO3
IV	JavaScript - JavaScript Basics - DOM Manipulation and Events - Functions, Objects and Arrays - Form Validation	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO4, CLO5



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

Assessment Methodologies

(E) Internal Assessment

a. Internal Formative assessment (Any two)

- (a) Quizzes
- (b) Assignment, Self-learning and Terms work
- (c) Seminar/Presentation

b. Internal Summative Assessment

- (a) Internal test

(F) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage(Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1	32	6	6	2	14
II	CLO2	28	5	5	3	13
III	CLO3	32	4	5	4	13
IV	CLO4, CLO5	28	3	3	4	10
		120	18	19	13	50

Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Quizzes, Assignments, Self-learning and Teamwork, Seminar/Presentation, Internal test	50
2	End-Semester Examination	Written Exam	50

(G) CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	3	1	-	-	-	-	1	-	-
CLO2	3	3	3	2	-	-	-	-	-	-
CLO3	3	3	3	3	2	-	-	-	-	-
CLO4	3	3	3	3	3	2	-	2	2	1
CLO5	3	3	3	3	3	3	2	-	-	-



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

- Suggested Learning Materials Books:**

Sr. No.	Title	Author(s)	Edition and Year	Publisher
1	Web Technologies	Uttam K. Roy	2010	Oxford
2	HTML5 Black Book	Kogent Learning Solutions	2nd Edition, 2016	Dreamtech
3	CSS: The Definitive Guide	Eric Meyer	4th Edition, 2017	O'Reilly
4	JavaScript: The Good Parts	Douglas Crockford	1st Edition, 2008	O'Reilly
5	Learning Web Design	Jennifer Niederst Robbins	5th Edition, 2018	O'Reilly
6	Web Programming Building Internet Applications	Chris Bates	3rd Edition, 2006	Wiley

- Online Resources (Open Source)**

Sr. No.	Description of Resource(s)	Weblink
1	HTML, CSS, JavaScript Tutorials	https://www.w3schools.com/
2	Greeks for Greaks	https://www.geeksforgeeks.org/



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P1S02CDCA03	Computer Networks	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Understand basic concepts of computer networks and data communication.

CLO2: Explain networking models, protocols, and transmission techniques.

CLO3: Analyze LAN technologies, topologies, and networking devices.

CLO4: Understand Internet concepts and network services such as DNS, Email, and WWW.

CLO5: Apply basic networking knowledge for real-world applications and troubleshooting.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Introduction And Data Communication Fundamentals - Computer Networks: Definition, objectives, advantages - Types of Networks: LAN, MAN, WAN - Transmission Technologies: Broadcast and Point-to-Point - Data Communication Components - Transmission Media: - Guided (Twisted Pair, Coaxial, Optical Fiber) - Unguided (Radio Waves, Microwave, Infrared) - Basics of Signal Transmission (Analog & Digital) - Decentralized governance (Mahajanapadas) as network models - Communication systems in ancient India (messenger systems, symbols)	Classroom Lectures, ICT Tools,	CLO1
II	Protocol Hierarchies, Reference Models and Transmission Techniques - Protocol Hierarchies and Design Issues - OSI Reference Model (Layer-wise functions) - TCP/IP Model and comparison with OSI - Multiplexing Techniques (FDM, TDM) - Switching Techniques: - Circuit Switching - Message Switching - Packet Switching	Classroom Lectures, ICT Tools,	CLO2
III	Local Network Technology - LAN Topologies: Bus, Star, Ring, Mesh - Network Devices: Hub, Switch, Router, Bridge, Gateway - MAC Protocols: CSMA/CD - Ethernet Technology (IEEE 802.3) - Introduction to Wireless LAN	Classroom Lectures, ICT Tools,	CLO3



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

IV	The Internet - Introduction to Internet and World Wide Web (WWW) - Web Browsers and Web Servers - Electronic Mail (E-mail): Architecture & Services - Domain Name System (DNS) - URL, IP Address basics - Introduction to Satellite Communication - GEO, MEO, LEO Satellites	Classroom Lectures, ICT Tools,	CL04, CL05
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• Assessment Methodologies

(H) Internal Assessment

a. Internal Formative assessment (20 Marks)

- Assignment, Self-learning and Term work
- Seminar / Presentation
- Quizzes

b. Internal Summative Assessment (30 Marks)

- Mid-term Test

(I) External Examination (50 Marks)

a. Term-end Examination

(J) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1	30	4	5	3	12
II	CLO2	30	3	5	4	12
III	CLO3	30	3	4	5	12
IV	CLO4, CL05	30	2	4	8	14
		120	12	18	20	50

• Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity, and Internal Test	50
2	End-Semester Examination	Written Exam	50



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

(K) CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	–	–	–	3	1	–	–	–
CLO2	3	3	2	–	–	3	1	–	–	–
CLO3	3	3	2	–	–	3	1	1	–	–
CLO4	2	2	2	2	–	3	2	1	1	1
CLO5	3	3	3	–	2	3	2	2	1	1

• Suggested Learning Materials Books:

Sr. No.	Title	Author(s)	Edition/Year	Publisher
1	Computer Networks	Tanenbaum A. S.	5th Edition / 2019 (Originally 2002)	Prentice-Hall of India Pvt. Ltd., New Delhi
2	Data Communications and Networking	Forouzan B. A.	5th Edition / 2013	Tata McGraw-Hill
3	Data and Computer Communications	Stallings W.	10th Edition / 2014	Macmillan Publication Company, New York

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	Computer Networking Basics – TutorialsPoint	https://www.tutorialspoint.com/computer_networking
2	Data Communication and Networking Notes – GeeksforGeeks	https://www.geeksforgeeks.org/computer-network-tutorials/
3	OSI Model and TCP/IP – Study Material	https://www.javatpoint.com/osi-model
4	IKS Division, Ministry of Education	https://iksindia.org



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PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSE	P1S02EDCA01	Artificial Intelligence and Machine Learning	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain the fundamentals of Artificial Intelligence and Machine Learning.

CLO2: Apply AI-based search techniques to solve simple real-life problems.

CLO3: Develop fuzzy rule-based systems.

CLO4: Implement basic connectionist models and various types of learning to solve classification or prediction problems.

CLO5: Design evolutionary solutions for optimisation and scheduling problems.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Artificial Intelligence (AI) and Knowledge Based Systems (KBS) - Natural and Artificial Intelligence - Testing Intelligence with the Turing Test, Application Areas of Artificial Intelligence, Data Pyramid - Production systems and AI-based searches like Hill Climbing and Heuristic Search - KBS Structure, Components of KBS, Categories of KBS, Knowledge-Based Shell, Advantages, Limitations and Applications of KBS - Knowledge Acquisition, Knowledge Update - Factual and Procedural Knowledge Representations - Dharma-based ethics and responsible use of technology - Rule-based systems in ancient texts	Classroom Lecture, Seminars, and Case-Based Learning (CBL) ICT-Enabled Learning	CLO 1 CLO 2
II	Fuzzy Logic - Fuzzy Logic and Fuzzy Sets, Membership Functions, - Fuzzification and Defuzzification - Operations on Fuzzy Sets - Fuzzy Functions and Linguistic Variables - Fuzzy Relations, Propositions and Connectives - Fuzzy Inference - Fuzzy Rules, Fuzzy Control System and Fuzzy Rule Based Systems	Classroom Lecture, Seminars, and Case-Based Learning (CBL) ICT-Enabled Learning	CLO 3
III	Connectionist Models and Learning - Introduction to ANN, Biological Neuron and Artificial Neuron - Hopfield model of ANN, Parallel relaxation - Single perceptron, Multi-Layer Perceptron, Applications of ANN and Cases - Machine Learning workflow - Types of Machine Learning: Supervised, Unsupervised, and Reinforcement Learning	Classroom Lecture, Seminars, and Case-Based Learning (CBL) ICT-Enabled Learning	CLO 4



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

IV	Genetic Algorithms	Classroom Lecture, Seminars, and Case-Based Learning (CBL) ICT-Enabled Learning	CLO 5
	– Introduction to Genetic Algorithm (GA), – Fundamental Concepts of GA: Gene, Population, Fitness Functions, Generations – Encoding Strategies, Genetic Operators, Fitness Functions – Typical Genetic Algorithm Cycle – Function Optimisation, Designing Special Operators and Edge Recombination, Travelling Salesman Problem – Schema, Genetic programming		

• Assessment Methodologies

(L) Internal Assessment

a. Internal Formative assessment (Any two)

- Assignment, Self-learning and Terms work
- Seminar/Presentation
- Quizzes

b. Internal Summative Assessment

- Mid-term Test

(M) External Examination (50 Marks)

a. Term-end Examination

(N) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/Analyse & above (A)	
I	CLO 1 CLO 2	40	3	3	8	14
II	CLO 3	26	3	3	6	12
III	CLO 4	27	3	3	6	12
IV	CLO 5	27	3	3	6	12
		120	12	12	26	50

• Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Quizzes, Assignments, Self-learning and Team work, Seminar/Presentation, and Internal Test	50 %
2	End-Semester Examination	Written Exam	50 %



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

(O)CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	-	-	-	-	1	-	1	1
CLO2	2	3	2	-	-	-	1	-	-	1
CLO3	2	2	3	-	-	1	1	-	-	1
CLO4	3	2	3	-	-	2	1	-	-	2
CLO5	2	3	3	-	-	2	1	1	-	2

• Suggested Learning Materials Books:

Sr. No.	Title	Author(s)	Edition /Year	Publisher
1	Artificial Intelligence	Rich and Knight	2018	Tata McGraw-Hill Publishing Co. Ltd.
2	Knowledge-Based Systems	Rajendra Akerkar, Priti Sajja	2010	Jones & Bartlett Learning
3	Neural Network, Fuzzy Logic and Genetic Algorithms	Vijyalaxmi Pai and Rajasekaran	2011	Prentice Hall of India
4	Machine Learning for Beginners	Dr. Harsh Bhasin	2nd Edition, 2020	BPB Publications

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	IKS Division, Ministry of Education	https://iksindia.org



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PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSE	P1S02EDCA02	E-Commerce	4-0-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Explain the concepts, models, and infrastructure of E-Commerce and digital business.

CLO2: Analyse E-Commerce business models, revenue strategies, and digital marketing techniques.

CLO3: Design and develop basic E-Commerce applications using web technologies.

CLO4: Evaluate security, legal, ethical, and payment issues in E-Commerce systems.

CLO5: Apply modern tools and technologies to build scalable, user-centric E-Commerce solutions.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Introduction - Introduction of E-Commerce - History & evolution - E-Business vs E-Commerce - E-Commerce types (B2B, B2C, C2C, G2C) - E-Commerce architecture and infrastructure (hardware, software, network)	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO1
II	Business Models & Digital Marketing - E-Commerce business models - Revenue models - E-marketplaces, Supply chain & logistics - Digital marketing (SEO, SEM, Social media, Email marketing) - CRM & ERP basics	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO2
III	E-Commerce Application Development - Website design principles - UI/UX basics - Shopping cart, Product catalog, Payment gateway integration basics, Order processing - Introduction to CMS, Web technologies overview	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO3
IV	Advanced Concepts in E-Commerce - E-Payment systems (Credit/Debit cards, UPI, wallets) - Security issues in E-Commerce - Cyber laws - IT Act - Ethical issues	Classroom Lecture, ICT-Enabled Learning, Problem-Based Learning	CLO4, CLO5



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

• Assessment Methodologies

(P) Internal Assessment

a. Internal Formative assessment (Any two)

- Assignment, Self-learning
- Seminar/Presentation
- Quizzes

b. Internal Summative Assessment

- Internal test

(Q) External Examination (50 Marks)

a. Term-end Examination

(R) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1	32	4	6	4	14
II	CLO2	28	4	5	3	12
III	CLO3	32	4	5	3	12
IV	CLO4, CLO5	28	3	5	4	12
		120	15	21	14	50

• Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Quizzes, Assignments, Self-learning and Team work, Seminar/Presentation, Internal test	50
2	End-Semester Examination	Written Exam	50

(S) CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	1	1	-	-	2	-	1	2
CLO2	3	2	2	2	1	-	2	1	1	2
CLO3	3	3	3	2	1	2	2	2	2	2
CLO4	2	3	2	2	1	2	2	1	3	2
CLO5	2	3	3	3	2	3	3	2	3	3



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

- Suggested Learning Materials Books:**

Sr. No.	Title	Author(s)	Edition/Year	Publisher
1	E-Commerce: Business, Technology, Society	Kenneth C. Laudon & Carol Guercio Traver	16 th Edition / 2021	Pearson
2	E-Commerce Strategy, Technologies and Applications	David Whiteley	4 th Edition / 2016	McGraw Hill
3	Fundamentals of E-Commerce	Ravi Kalakota & Andrew B. Whinston	2 nd Edition / 2017	Pearson
4	Digital Marketing	Seema Gupta	1 st Edition / 2018	McGraw Hill
5	Electronic Commerce	Gary P. Schneider	11 th Edition / 2017	Cengage Learning

- Online Resources (Open Source)**

Sr. No.	Description of Resource(s)	Weblink
1	NPTEL E-Commerce Courses	https://nptel.ac.in
2	Google Digital Garage (Digital Marketing)	https://learndigital.withgoogle.com
3	Shopify Learning Resources	https://www.shopify.com/learn



SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P1S02CDCA04	Cyber Security	2-0-0	60	02

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Evaluate cybercrime classifications, identify types of cybercriminals, and analyze the Indian ITA-2000 & cyber laws

CLO2: Analyze cybercrime tools like phishing, Social Engineering, keyloggers, Virus, Worms etc.

CLO3: Apply cryptography concepts and security services for secure communication.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Introduction to Cybercrime - Cybercrime: Definition and Origins Of The World - Cybercrime and Information Security - Who Are Cybercriminals? Types of Cybercriminals. - Classifications of Cybercrimes - Cybercrime and the Indian ITA-2000 & Cyber Laws - Introduction of Social Engineering, Cyberstalking, Phishing	Classroom Lectures, ICT-Enabled Learning Discussion, Real-life Examples	CLO1, CLO2
II	Methods Used in Cybercrime & Cryptography - Password Cracking - Key Loggers - Virus and Worms - Identity Theft - Security Services: Confidentiality, Authentication, Integrity, - Non-repudiation, Access Control, Availability - Concepts of Symmetric Key Algorithm - Concepts of Asymmetric Key Algorithm - Introduction to Digital Signature & Digital Certificate	Demonstration, Problem-based Learning, Classroom Lectures, ICT-Enabled Learning	CLO2, CLO3

• Assessment Methodology

(T) Internal Assessment

a. Internal Formative assessment (10 Marks)

- Assignment, Self-learning and Term work
- Seminar / Presentation
- Quizzes

b. Internal Summative Assessment (15 Marks)

- Mid-term Test



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PGDCA (Post Graduate Diploma in Computer Applications) Semester-II

(U) External Examination (25 Marks)

a. Term-end Examination

(V) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1, CLO2	30	2	3	7	12
II	CLO2, CLO3	30	3	3	7	13
		60	5	6	14	25

Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Seminars, Assignments, Quizzes, Class Regularity, and Internal Test	50
2	End-Semester Examination	Written Exam	50

(W) CLOs – PLOs Matrix

CLO	PLO									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	2	3	–	–	–	–	1	–	3	1
CLO2	2	3	1	–	–	2	–	–	3	1
CLO3	3	2	2	–	–	2	–	–	3	2

Suggested Learning Materials Books:

Sr.No.	Title	Author(s)	Edition/Year	Publisher
1	Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives	Nina Godbole, Sunit Belpure	1st Edition / 2011	Wiley
2	Computer Networks	Andrew S. Tanenbaum, David J. Wetherall	5th Edition / 2011	Pearson Education
3	Network Security Essentials: Applications and Standards	William Stallings	5th Edition / 2014	Pearson

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	Cyber Laws in India (ITA-2000 Overview)	https://www.indiacode.nic.in/
2	Types of Cyber Attacks – Geeks for Geeks	https://www.geeksforgeeks.org/types-of-cyber-attacks/
3	Cryptography Basics	https://www.geeksforgeeks.org/cryptography-and-its-types/
4	Phishing Awareness	https://www.cisco.com/c/en/us/products/security/email-security/what-is-phishing.html



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Course Type	Course Code	Course Title	Teaching-Learning Scheme	Total Notional Hours	Course credits
			L-P-T		
DSC	P1S02CDCA05	PRACTICALS - II	0-8-0	120	04

• Course Learning Outcomes (CLOs)

On completion of this course, students will be able to:

CLO1: Develop Java programs using object-oriented programming concepts.

CLO2: Implement advanced Java features, including exception handling, file I/O, collections, multithreading and develop GUI applications using Java and Swing.

CLO3: Explain fundamentals of web technology, client-server architecture, and web terminologies.

CLO4: Use JavaScript for client-side scripting with basic programming constructs.

CLO5: Apply CSS3 for styling, layouts, and responsive web design.

Unit	Course Content	Learning Pedagogies*	CLO(s)
I	Practical training and hands-on sessions on Java	Problem-Based Learning, Self-Directed Learning	CLO1, CLO2
II	Practical training and hands-on sessions on Web Technology	Problem-Based Learning, Self-Directed Learning	CLO3, CLO4, CLO5

• Assessment Methodologies

(X) Internal Assessment

a. Internal Formative assessment (20 Marks)

i. Assignment

ii. Quizzes

b. Internal Summative Assessment (30 Marks)

i. Mid-term Test

(Y) External Examination (50 Marks)

a. Term-end Examination

(Z) Weightage of Learning Efforts for External Assessment

Unit	Aligned COs	Total Learning Hours	Approximate weightage (Marks) to Learning levels (BT)			Total Marks
			Remember (R)	Understanding (U)	Application/ Analyse & above (A)	
I	CLO1, CLO2	60	5	8	12	25
II	CLO3, CLO4, CLO5	60	5	8	12	25
		120	10	16	24	50



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• Assessment and Evaluation

Sr. No.	Assessment/Evaluation	Component	Weightage (%)
1	Continuous Internal Evaluation	Assignments, Quizzes, Laboratory Regularity, and Internal Test	50
2	End-Semester Examination	Practical Examinations	50

(AA) CLOs – PLOs Matrix

CLO	PLO\									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	3	2	3	2	–	1	1	1	–	2
CLO2	3	3	3	2	–	2	2	1	1	2
CLO3	3	2	3	3	1	2	2	1	1	2
CLO4	3	2	3	2	3	2	1	–	1	2
CLO5	3	3	3	3	2	2	2	2	1	3

• Suggested Learning Materials Books:

Sr. No.	Title	Author(s)	Edition/Year	Publisher
1	Java: The Complete Reference	Herbert Schildt	12th Edition, 2021	McGraw Hill
2	Core Java Volume I - Fundamentals	Cay S. Horstmann	12th Edition, 2021	Pearson
3	Head First Java	Kathy Sierra, Bert Bates, Trisha Gee	3rd Edition, 2022	O'Reilly Media
4	Web Technologies	Uttam K. Roy	2010	Oxford
5	HTML5 Black Book	Kogent Learning Solutions	2nd Edition, 2016	Dreamtech
6	CSS: The Definitive Guide	Eric Meyer	4th Edition, 2017	O'Reilly

• Online Resources (Open Source)

Sr. No.	Description of Resource(s)	Weblink
1	Official Oracle Java Tutorials for comprehensive concepts covering OOP, Collections, and GUI (Swing).	https://docs.oracle.com/javase/tutorial/
2	Detailed tutorials and practical examples for core and advanced Java programming topics.	https://www.geeksforgeeks.org/java/
3	Free Code Camp: Project-based learning for Responsive Web Design and JavaScript Data Structures.	https://www.freecodecamp.org/