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VEER NARMAD SOUTH GUJARAT UNIVERSITY
University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉદ્ધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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ક્રમાંક : એસ./સિલેબસ/પરિપત્ર/૬૫૩૭/૨૦૨૨
તા. ૩૧/૦૩/૨૦૨૨

પ્રતિ,
વડાશ્રી,
ડિપાર્ટમેન્ટ ઓફ કોમ્પ્યુટર સાયન્સ,
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી,
સુરત.

વિષય :- PG DCA નાં રિવાઈઝડ અભ્યાસક્રમ બાબત.

મહાશયશ્રી,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૨-૨૩થી અમલમાં આવનાર PG DCA નાં પેટાસમિતિએ તૈયાર કરેલ અભ્યાસક્રમ કોમ્પ્યુટર સાયન્સ અભ્યાસસમિતિની તા.૨૧/૦૩/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંક: ૪ અન્વયે મંજૂર કરી કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાને કરેલ ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાની તા.૨૧/૦૩/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંક: ૦૪ અન્વયે સ્વીકારી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલે તેની તા.૨૩/૦૩/૨૦૨૨ ની સભાના ઠરાવ ક્રમાંક: ૧૫૪ અન્વયે મંજૂર કરેલ છે. જેની આથી જાણ કરવામાં આવે છે.

કોમ્પ્યુટર સાયન્સ અભ્યાસસમિતિની તા.૨૧/૦૩/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંક: ૪ આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૨-૨૩થી અમલમાં આવનાર PG DCA નાં પેટાસમિતિએ તૈયાર કરેલ અભ્યાસક્રમ મંજૂર કરી કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.
કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાની તા.૨૧/૦૩/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંક: ૪

આથી ઠરાવવામાં આવે છે કે, કોમ્પ્યુટર સાયન્સ અભ્યાસ સમિતિની તા.૨૧/૦૩/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંક: ૦૪ અન્વયે કરેલ ભલામણ સ્વીકારી શૈક્ષણિક વર્ષ-૨૦૨૨-૨૩ થી અમલમાં આવનાર PG DCA નો અભ્યાસક્રમ મંજૂર કરવા એકેડેમિક કાઉન્સિલને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૨૩/૦૩/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંક: ૧૫૪

આથી ઠરાવવામાં આવે છે કે, કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાની તા.૨૧/૦૩/૨૦૨૨ની સભાનાં ઠરાવ ક્રમાંક: ૦૪ અન્વયે કરેલ ભલામણ સ્વીકારી શૈક્ષણિક વર્ષ ૨૦૨૨-૨૩ થી અમલમાં આવનાર PG DCA નો અભ્યાસક્રમ મંજૂર કરવામાં આવે છે.

બિડાણ : ઉપર મુજબ

પ્રતિ,

- ૧) અધ્યક્ષશ્રી, કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખા
 - ૨) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
- ...તરફ જાણ તેમજ અમલ સારૂ.

ઈ.ચા.કુલસચિવ



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Post Graduate Diploma in Computer Application

Name of Program	Post Graduate Diploma in Computer Application
Abbreviation	PGDCA
Duration	1 Year (Regular) – (2 Semesters)
Eligibility Criteria	Graduate degree in any faculty from a recognized university.
Objective of Program	PGDCA programme is aimed towards building prospective career in the field of computer application. The programme is designed with the objective to provide knowledge and skills in the various aspects of computer applications and core programming. Students will also be trained in the latest trends of information technology.
Program Outcome (PO)	<p>PO1: Fundamental Knowledge Enrichment Program trains students with the core computer science and Information Technology (IT) knowledge domains. It also makes students capable of using core concepts in the conceptualization of domain specific application development.</p> <p>PO2: Critical Thinking Development The program develops the skills of critical thinking, problem solving, evaluative learning of various techniques, and understanding the essence of the problem.</p> <p>PO3: Advanced Emerging Technology Awareness The program trains students with the latest technologies that is being used in the industry. The continuous syllabi review adds value to the program for the outgoing students and make them ready to face challenging demands of the industry.</p> <p>PO4: Advanced Tools Usage The program teaches the students to apply the advanced tools to solve real world problems.</p> <p>PO5: Nurturing Project Planning and Management Capabilities The program trains students for designing and conceptualizing the software architecture, planning, and managing the product development process of complex and live software projects. It also makes students understand the decision making for selection of an appropriate project management capabilities.</p> <p>PO6: Real World Problem / Project Development Real world project provides the candidates exposure to work in the challenging and demanding environment of the industry. The project development training makes students employable and industry ready.</p>



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	<p>PO7: Teamwork and Leadership Development Trains students to work in a team and also to take leadership of the of the project management team.</p>																																																																															
Program Specific Outcomes (PSO)	<p>PSO1: Develop and strengthen the fundamental core concepts that are required to solve practical problems. PSO2: Develop the professional and entrepreneurship skills that needs independent logical and analytical thinking, teamwork, and leadership. PSO3: Nurture the students to investigate for the design and development of a workable solution for a real-world problem. PSO4: Train students for self-learning and challenging problem solving. PSO5: Train students to use recent desktop application and web designing tools. PSO6: Inculcate the passion for continuous learning for making a successful professional career.</p>																																																																															
Mapping between POs and PSOs	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> <th colspan="2"></th> </tr> </thead> <tbody> <tr> <th>PO1</th> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <th>PO2</th> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <th>PO3</th> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <th>PO4</th> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <th>PO5</th> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <th>PO6</th> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <th>PO7</th> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> </tbody> </table>									PSO1	PSO2	PSO3	PSO4	PSO5	PSO6			PO1									PO2									PO3									PO4									PO5									PO6									PO7								
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PO7																																																																																
Medium of Instruction	English																																																																															
Program Structure	Semester 1																																																																															
Course Code	Title	Teaching per Week		Course Credits	University Examination		Internal Marks	Total Marks																																																																								
		Theory	Practical		Duration	Marks																																																																										
101	Fundamentals of Computers and Introduction to Information Technology	4	0	4	3 Hrs	70	30	100																																																																								
102	Database Management Systems	4	0	4	3 Hrs	70	30	100																																																																								
103	Fundamentals of Python	4	0	4	3 Hrs	70	30	100																																																																								
104	Introduction to Front End Technology	4	0	4	3 Hrs	70	30	100																																																																								
105	Office Automation Tools	4	0	4	3 Hrs	70	30	100																																																																								
106	Practical - I	0	4	4	2 Hrs	70	30	100																																																																								
107	Practical – II	0	3	3	2 Hrs	70	30	100																																																																								
108	Practical – III	0	3	3	2 Hrs	70	30	100																																																																								
	Total	20	10	30		560	240	800																																																																								



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Program Structure		Semester 2						
Course Code	Title	Teaching per Week		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
201	Website development using WordPress	4	0	4	3 Hrs	70	30	100
202	Open-Source Web based Technology (PHP/MySQL)	4	0	4	3 Hrs	70	30	100
203	Digital Marketing	4	0	4	3 Hrs	70	30	100
204	E-Commerce and Network Security Essentials	4	0	4	3 Hrs	70	30	100
205	Practical – IV	0	4	3	2 Hrs	70	30	100
206	Practical – V	0	4	3	2 Hrs	70	30	100
207	Project	0	--	8	--	200	--	200
Total		16	8	30		620	180	800



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PGDCA 1st Semester

Course: 101: Fundamentals of Computers and Introduction to Information Technology

Course Code	101																																										
Course Title	Fundamentals of Computers and Introduction to Information Technology																																										
Credit	4																																										
Teaching per Week	4 Hrs																																										
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																																										
Effective From	June 2022																																										
Purpose of Course	This course helps students to understand fundamentals of computer. The course also gives students an idea about various components of computer hardware and its working. The course also briefs the concepts of various operating systems. Students will also be able to learn about Internet and popular internet services like e-mail.																																										
Course Objective	<ul style="list-style-type: none"> • To make students understand computer hardware fundamentals. • To make students understand various components of computer and their working. • To make students understand the importance and use of operating systems. • To make students understand about Internet and internet services. 																																										
Course Outcomes	<p>CO1: Explain students about how computer works and the importance of various components of computers.</p> <p>CO2: Understanding the secondary storage devices like HDD, CD, DVD, Blu-ray, and other portable devices.</p> <p>CO3: To provide students a foundation of the importance and use of operating systems.</p> <p>CO4: Explain and train students to use GUI OS, Windows component, files and folder and control panel.</p> <p>CO5: Explain and train students to utilize Internet, Email, and search engine.</p>																																										
Mapping between COs with PSOs	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO2</td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO3</td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO4</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO5</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	CO1							CO2							CO3							CO4							CO5						
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CO1																																											
CO2																																											
CO3																																											
CO4																																											
CO5																																											
Pre-requisite	Nil																																										
Course Content	<p>Unit 1. Basic Computer Organization</p> <p>1.1. Hardware parts of Computer</p> <p>1.2. Block diagram of Computer</p> <p>1.3. I/O devices: Keyboards, Monitors, Pointing Devices, Scanners, OMR, OCR, Printers</p>																																										



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	<ul style="list-style-type: none">1.4. Primary Storage: RAM, ROM (and its types), Cache Memory, Virtual Memory1.5. Ports: Serial, Parallel, PS2, USB1.6. Basic Troubleshooting <p>Unit 2. Secondary Storage</p> <ul style="list-style-type: none">2.1. Electro-Magnetic storage devices: FDD, HDD2.2. Optical storage devices: CD, DVD, Blu-ray2.3. Other portable storage devices <p>Unit 3. Operating System Concepts</p> <ul style="list-style-type: none">3.1. History and Evolution of OS3.2. Need of OS3.3. Single user & Multi-user OS3.4. Elements and Functions of OS3.5. File System (e.g., FAT, NTFS etc.)3.6. Common File types (e.g., jpg, doc, txt, pdf etc.)3.7. BIOS, POST Operation <p>Unit 4. Introduction to GUI OS</p> <ul style="list-style-type: none">4.1. Introduction to Windows and Windows User Interface4.2. Windows versions, Wizard4.3. Windows Components like Desktop, Start menu, My Computer, Recycle Bin, Notepad, Icons, Dialog Boxes & Toolbars etc.4.4. Working with Files & Folders: File and Directory management, create, copy, delete, move files, Shortcuts, Types of files, File attributes, Windows Explorer4.5. Setting Environment using Control Panel – Date & Time, Display, System, Printers, Audio, Network, Fonts, Users, Installing and uninstalling new Hardware & Software on your computer etc.4.6. Searching Files, Computers <p>Unit 5. Introduction to Internet & E-mail</p> <ul style="list-style-type: none">5.1. What is Internet?5.2. Web Browsers and URL5.3. Internet Settings, Browser Settings5.4. Web Services like www, ftp, e-mail, chat, search engine etc.5.5. Concept of Telnet, Remote Desktop5.6. Basics of E-mail<ul style="list-style-type: none">5.6.1. What is an Electronic Mail?5.6.2. Email Addressing5.6.3. Mailbox: Inbox and Outbox5.6.4. Composing and sending a new E-mail5.6.5. Replying, Forwarding an E-mail message5.6.6. Sorting and Searching emails5.6.7. Mail Attachments5.6.8. Using Address book5.6.9. Handling SPAM5.6.10. E-mail protocols like POP3, SMTP5.6.11. Difference between Offline Mail Client (Outlook) and Browser based E-mail services
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Reference Books	<ol style="list-style-type: none">1. Fundamentals of Computers – E Balagurusamy, McGrawHill2. Fundamentals of Computer – V. RajaRaman3. How Computers work - Ron White – Techmedia4. How Internet work – Ron White – Techmedia5. Introduction to computers - Peter Norton – TMH6. Inside IBM PC - Peter Norton - PHI7. Operating Systems - Stallings – PHI8. Windows XP – Complete Reference, BPB
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



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PGDCA 1st Semester

Course: 102: Database Management Systems

Course Code	102																																			
Course Title	Database Management Systems																																			
Credit	4																																			
Teaching per Week	4 Hrs																																			
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																																			
Effective From	June 2022																																			
Purpose of Course	This course is an introduction of the concepts of Database Management Systems. The course gives the knowledge about structure and use of Database Management System with major focus on database design and query processing.																																			
Course Objective	<ul style="list-style-type: none"> • To make students understand basic concepts of Database management systems. • To make students capable to design good database design with implementation of various constrains. • To make students effectively use database for storing, managing, and retrieving data from DBMS like MS-ACCESS using SQL statements. 																																			
Course Outcomes	<p>CO1: Introduce and explain Basics of Database, Database Management System, Various pros and cons of manual system and database system and its applications.</p> <p>CO2: Train students to apply various constraints on database and to store and retrieve data easily.</p> <p>CO3: Explain and train students to deal with inconsistency of the database, removing various database anomalies using normalization approach.</p> <p>CO4: Train students to work with DBMS like MS-ACCESS via SQL Interface.</p>																																			
Mapping between COs with PSOs	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO2</td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO3</td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO4</td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	CO1							CO2							CO3							CO4						
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CO1																																				
CO2																																				
CO3																																				
CO4																																				
Pre-requisite	Nil																																			
Course Content	<p>Unit 1. Basic Concepts of Database Management System</p> <p>1.1 Fundamental concepts of databases</p> <p>1.2 Purpose of database system</p> <p>1.3 Structure of database – instance, schema, record, fields</p> <p>Unit 2. Integrity Constraints</p> <p>2.1. Domain Constraints</p> <p>2.2. NULL & NOT NULL constraint</p> <p>2.3. Key Constraints</p>																																			



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	<p>2.3.1. Concepts of Key: Super, Candidate, Primary, Unique 2.3.2. Defining Key constraints - Primary key and Unique key 2.4. Referential Integrity Constraints & foreign key 2.5. Introduction to Constraints defining Business Rules</p> <p>Unit 3. Relational Database - Normalization 3.1. Functional Dependencies 3.1.1. Trivial Functional Dependencies 3.1.2. Partial and Full Functional Dependencies 3.1.3. Transitive Functional Dependencies 3.2. Need for Normalization 3.3. Normalization using functional dependencies - up to 3NF</p> <p>Unit 4. SQL Statements - DDL 4.1. Working with databases and tables. 4.2. Data types, conventions, and terminology 4.3. DDL statements - CREATE TABLE, ALTER TABLE, DROP TABLE</p> <p>Unit 5. SQL Statements - DML 5.1. DML statements- INSERT, UPDATE, DELETE, TRUNCATE 5.2. SELECT Statement 5.2.1. Clauses of SELECT Statement 5.2.2. Built-in function and aggregate functions 5.2.3. Querying multiple tables using join</p>
Reference Books	<ol style="list-style-type: none"> 1. Database System Concepts – SILBERSCHATZ, KORTH, SUDARSHAN- McGraw-Hill 2. An introduction to Database Systems- C. J. DATE – Addison Wesley 3. Database System: A practical approach to design implementation and management – THOMAS CONNOLLY, CAROLYN BEGG, Pearson Education 5. Access - The Complete Reference – Virginia Andersen – McGraw - Hill 6. Access Database Design & Programming – Steven Roman - O' Reilly 7. Microsoft Access: Bible – Cary N. Prague
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



**Department of Computer Science,
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PGDCA 1st Semester

Course: 103: Python Programming

Course Code	103																																			
Course Title	Python Programming																																			
Credit	4																																			
Teaching per Week	4 Hrs																																			
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																																			
Effective From	June 2022																																			
Purpose of Course	The Python language is used popularly among the people working in the area of Machine Learning (ML), Data Analytics, Artificial Intelligence, Web Application, and even the people working on Desktop Applications. This course imparts to the students understanding of Python programming language.																																			
Course Objective	<ul style="list-style-type: none"> To make students understand Python Language. To make students understand various components of language and its Working. 																																			
Course Outcomes	<p>CO1: Students will be able to Write, Test and Debug Python Programs.</p> <p>CO2: Students will be able to Implement Conditionals and Loops, use functions and represent Compound data using Lists, Tuples and Dictionaries in Python programs.</p> <p>CO3: Students will be able to develop Real World Application.</p> <p>CO4: Students will learn essential packages like NumPy, which are necessary for Machine Learning, Data Analytics, and AI.</p>																																			
Mapping between COs with PSOs	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO2</td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> </tr> <tr> <td>CO4</td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO4</td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	CO1							CO2							CO4							CO4						
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CO4																																				
Prerequisite	Basic Programming Knowledge.																																			
Course Content	<p>Unit 1. Fundamentals of Python</p> <ol style="list-style-type: none"> 1.1. Features of Python 1.2. Python's Integrated Development and Learning Environment (IDLE) 1.3. Python identifiers 1.4. Python Operators 1.5. Python Datatypes <ol style="list-style-type: none"> 1.5.1. Numeric: integer, float, complex 1.5.2. Sequence: list, tuple, range 1.5.3. Sets 1.5.4. Texts 1.5.5. Iterator 1.5.6. Mapping: dictionary 1.6. Input/Output in Python 																																			



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	<p>Unit 2. Program Logic</p> <p>2.1. Control Structures</p> <p>2.1.1.If, if..else, nested if, if...elif...else, shorthand if, shorthand if..else</p> <p>2.1.2.while loop</p> <p>2.1.3.for loop</p> <p>2.1.4.break, continue, pass</p> <p>2.2. Functions in Python</p> <p>2.2.1.Function declaration</p> <p>2.2.2.Passing arguments to function</p> <p>2.2.3.Return values</p> <p>2.2.4.Variable scope and name space</p> <p>2.2.5.Lambda function</p> <p>2.2.6.Recursive function</p> <p>2.2.7.Built-in functions</p> <p>Unit 3. Modules</p> <p>3.1. Creation of module</p> <p>3.2. Importing a module</p> <p>3.3. Date & time module</p> <p>Unit 4. Exception Handling</p> <p>4.1. try, catch, finally</p> <p>4.2. Multiple error handling: except</p> <p>4.3. Throwing a particular error: raise</p> <p>Unit 5. NumPy Package</p> <p>5.1. Installing NumPy</p> <p>5.2. NumPy Array: dtype, shape, reshape, ndim, itemsize, empty, zeros, ones, fromiter, arrange, linspace</p> <p>5.3. Indexing and slicing, broadcasting</p> <p>5.4. Array manipulation: changing shapes, transpose, changing dimension, joining, and splitting arrays, adding and removing elements</p> <p>5.5. Mathematical functions and matrix library</p>
Reference Books	<ol style="list-style-type: none"> 1. Python Programming, Anurag Gupta, G Biswas,, Mc Graw Hill 2. Exploring Python, Timothy A. Budd, McGraw Hill Publication 3. Core Python Programming, R. Nageswara Rao, Dreamtech Press 4. Learning Python, 5th Edition, Mark Lutz, O'Reilly Media 5. Python Projects, Laura Cassell, Alan Gauld, Wrox Publication 6. NumPy: Beginner's Guide, 3rd Edition, Ivan Idris, Packt Publishing 7. NumPy Essentials, Leo Chin, Tanmay Dutta, Packt Publishing 8. Matplotlib 2.x By Example, Allen Yu, Claire Chung, Aldrin Yim, Packt Publishing
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



**Department of Computer Science,
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PGDCA 1st Semester

Course: 104: Front-end Technologies

Course Code	104																																			
Course Title	Front-end Technologies																																			
Credit	4																																			
Teaching per Week	4 Hrs																																			
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																																			
Effective From	June 2022																																			
Purpose of Course	To understand the concepts of HTML, CSS, Front-end Scripting technologies.																																			
Course Objective	To teach the concepts of Front-end Scripting and its practical applications.																																			
Course Outcomes	<p>CO1: The students will get the insight of the fundamental aspects of the static web technology like HTML , CSS, and JavaScript.</p> <p>CO2: The students will get trained to represent declarative knowledge in the Bootstrap and its components, and hence students can learn static web designing.</p> <p>CO3: The students will get an exposure to the various UI technologies and their real-world use.</p> <p>CO4: The students will be able to design and develop web pages and Interactive UI for Web Applications.</p>																																			
Mapping between COs with PSOs	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO2</td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <td>CO4</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <td>CO4</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	CO1							CO2							CO4							CO4						
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CO4																																				
Prerequisite	Basic concepts of HTML, Web & Programming skills.																																			
Course Content	<p>Unit 1. Fundamentals of Web Technology</p> <p>1.1. HTML</p> <p>1.1.1. Basic HTML tags</p> <p>1.1.2. HTML Forms</p> <p>1.2. HTML5</p> <p>1.2.1. HTML5 new elements</p> <p>1.2.2. HTML5 Form elements</p> <p>1.2.3. HTML5 Attributes</p> <p>1.2.4. Canvas</p> <p>1.2.5. Video and Audio</p> <p>1.2.6. Web storage</p> <p>1.2.7. Geolocation</p> <p>1.2.8. HTML 5 APIs</p> <p>Unit 2. CSS3</p> <p>2.1. Introduction to CSS3</p>																																			



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	<p>2.2. Selectors and Classes 2.3. Font and Text effect 2.4. Colors, Gradients, Background Images, and Masks 2.5. Border and Box effects etc. 2.6. Embedding Media</p> <p>Unit 3. JavaScript 3.1. Fundamentals of JavaScript 3.2. Syntax of JavaScript 3.3. Use of JavaScript in HTML 3.4. Validation using JavaScript 3.5. DOM</p> <p>Unit 4: Introduction to Bootstrap 4.1. What is Bootstrap 4.1.1. What is Responsive web page 4.1.2. Advantages and features of Bootstrap 4.1.3. Setup Environment 4.1.4. Apply bootstrap to Application 4.2. Bootstrap with CSS 4.2.1. Grid system 4.2.2. Typography 4.2.3. Code, table, forms, buttons, image, responsive utilities etc. 4.3. Bootstrap components</p> <p>Unit 5 : Bootstrap components 5.1. What is Bootstrap component 5.2. Advantages of components 5.3. Types of Bootstrap components, Glyphicons, Drop downs, button group, input groups navigation, pagination etc.</p>
Reference Books	<ol style="list-style-type: none"> 1. Responsive Web Design with HTML5 and CSS3 By Ben Frain - Packt Publishing Ltd. 3. HTML, CSS & JavaScript Web Publishing in One Hour a Day, Sams Teach Yourself by Laura Lemay, Rafe Colburn, Jennifer Kyrnin — Sams Publication 4. Training Guide Programming in HTML5 with JavaScript and CSS3 (MCSD): 70-480 by Glenn Johnson - Pearson Education 5. Learning Bootstrap by Aravind Shenoy, Ulrich Sossou - Packt Publishing Ltd.
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



**Department of Computer Science,
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PGDCA 1st Semester

Course: 105: Office Automation Tools

Course Code	105																																																	
Course Title	Office Automation Tools																																																	
Credit	4																																																	
Teaching per Week	4 Hrs																																																	
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)																																																	
Review / Revision	June 2022																																																	
Purpose of Course	This course aims towards learning and use of office suite of applications namely word processing software, spreadsheet software and presentation software. The course also teaches students about various features of these software tools.																																																	
Course Objective	<ul style="list-style-type: none"> • To make students learn and use Word processing software. • To make students learn and use Spreadsheet application. • To make students learn and use Presentation software. 																																																	
Course Outcome	<p>CO1: Explain fundamental aspects of the MS Office suite and it's advantages to the students</p> <p>CO2: Train students about word processing such as formatting, tables, Macro, Mail Merge etc. using MS Word..</p> <p>CO3: Train students about concepts like data formatting, conditional formatting, charts etc. using MS Excel.</p> <p>CO4: Explain and train students about Professional Presentation with various tools like Animation, adding graphics and sound using MS PowerPoint.</p> <p>CO5: Expose the students to the various data formatting, processing and presentation technology and real-world use of it.</p> <p>CO6: After studying the course, students will be able to work with office suite and also understand about the important features of word processing software, spreadsheet software and presentation software.</p>																																																	
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CO6																																																		
Pre-requisite	Nil																																																	



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Course Content	<p>Unit 1. Introduction to Office Suite</p> <ol style="list-style-type: none">1.1. Features and uses1.2. Word-processing, Spreadsheet, Presentation, graphics <p>Unit 2. Word-processing</p> <ol style="list-style-type: none">2.1. Working with Word-processing2.2. Menus & Commands, Shortcut Menus, Toolbars2.3. Templates, Creating a New Document2.4. Document Views and layouts2.5. Working with –Styles2.6. Headers & Footers2.7. Text, Paragraph, Page Formatting2.8. Text Attributes, Text Editing, Text Enhancements2.9. Bullets & Numbering: Bulleted, Numbered & Multilevel List2.10. Format Painter and its use2.11. Tabs & Indents2.12. Auto formatting, Auto text, Autocorrect, Auto complete2.13. Insert page numbers, symbols, images, files etc.2.14. Insert Table of Contents, Footnote, Endnote, Citation, Cross Reference etc.2.15. Find & Replace2.16. Spell Check & Grammar, Thesaurus2.17. Tables<ol style="list-style-type: none">2.17.1. Create Tables2.17.2. Add, Delete, Insert, Merge Rows and Columns2.17.3. Convert Text to Table and Table to Text2.17.4. Borders and Shading2.18. Margins & Space management in Document2.19. Adding References and Graphics2.20. Mail Merge<ol style="list-style-type: none">2.20.1. Letters, Envelopes, Mailing Labels <p>Unit 3. Spreadsheet</p> <ol style="list-style-type: none">3.1. Concepts of Workbook & Worksheets3.2. Using Wizards3.3. Different Views of Worksheets3.4. Using different features with Data, Cell and Text3.5. Cell Markers3.6. Working with Data & Ranges, Various Data Types, Name a range of cells3.7. Cell Formatting, Conditional Formatting, Borders & Shading, Row Height, Column Width and other Format features3.8. Addressing and its types (Absolute, Relative)3.9. Series, Fill series of different types3.10. Column & Row Freezing, Labels, Hiding, Splitting etc.3.11. Inserting, Removing & Resizing of Columns & Rows3.12. Functions and their categories like Recently Used, Financial, Logical, Text, Text, Date & Time, Lookup & Reference etc.3.13. Use of Formulas, Calculations3.14. Chart Wizard, Different Chart Types3.15. Analysing data3.16. Creating Formats & Links
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	<p>3.17. Organizing Data in A List 3.18. Sorting and Filtering data 3.19. Sharing & Importing Data 3.20. What-if analysis using Goal Seek, Scenario 3.21. Spelling, Thesaurus, Protect Sheet, Protect Workbook, Password protection 3.22. Page Layout and Page formatting 3.23. Printing of Workbook & Worksheets with various options</p> <p>Unit 4. Presentation</p> <p>4.1. Introduction & use, working with PowerPoint 4.2. Creating a presentation 4.3. Using Wizards 4.4. Slides & different types, 4.5. Inserting, Deleting and Copying of Slides 4.6. Working with Notes, Handouts, Columns & Lists 4.7. Adding Graphics, Sounds and Movies to a Slide 4.8. Working with PowerPoint Objects 4.9. Designing & Presentation of a Slide Show 4.10. Printing Presentations, Notes, Handouts with print options 4.11. Master Slide and other Masters 4.12. Slide Transition, Automating Presentation, applying effects</p> <p>Unit 5. Comparison of various office suites like MS- Office, Lotus-Office, Star-Office, Open-Office etc.</p>
Reference Books	<ol style="list-style-type: none"> 1. Microsoft Office 2013 Bible, Microsoft Press 2. MS OFFICE XP COMPLETE BPB publication 3. The 2007 Microsoft Office System Inside Out, Microsoft Press 4. Mastering Word 97, Mansfield, Sybex Pub. 5. Mastering Excel 2010, Bill Jelen, BPB 6. Mastering Microsoft Office 97 – L.Moseley, D.Boody – BPB 7. Mastering Powerpoint 2000 – Murray K., BPB 8. The ABSs of Microsoft Office - Professional Edition by GuyHart –Davis, BPB Publication 9. The Essential Excel 97 Book - Faithe Wempen & Donna Ppayne, Galgotia Publication 10. MS Office Excel Step by Step, Curtis Frye, Microsoft Press
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



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PGDCA 1st Semester

Course: 106: Practical - I

Course Code	106
Course Title	Practical – I
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Practical Work, examination, preparation, holidays etc.)
Effective From	June 2022
Purpose of Course	<ul style="list-style-type: none">• The course gives the practical knowledge about structure and use of various database management systems with major focus on data storage, manipulation, and retrieval.• This course aims towards learning and use of office suite of applications like word processing software, spreadsheet software and presentation software.
Course Objective	<ul style="list-style-type: none">• To make students work practically on Structured Query Language.• To get students acquainted practically with various DBMS.• To make students learn and use Word processing software.• To make students learn and use Spreadsheet application.• To make students learn and use Presentation software.
Course Outcomes	<ul style="list-style-type: none">• Students will be able to effectively work with MS Access DBMS via SQL Interface.• Students will be able to work with office suite and also understand important features of word processing software, spreadsheet software and presentation software.
Course Content	Practical based on Course Code 102 (DBMS) using MS Access and Course Code 105 (Office Automation Tools)
Reference Books	As per Course Codes 102 and 105
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment. 70% External assessment.



**Department of Computer Science,
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PGDCA 1st Semester

Course: 107: Practical - II

Course Code	107
Course Title	Practical – II
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Practical Work, examination, preparation, holidays etc.)
Effective From	June 2022
Purpose of Course	The course gives the practical knowledge problem solving using Python programming language.
Course Objective	<ul style="list-style-type: none">• To make students aware of programming concepts• To make students aware of problem-solving using Python Programming language.
Course Outcomes	<ul style="list-style-type: none">• Students will be able to write computer programs• Students will be able to solve problems and write programs using Python Programming Language.
Course Content	Practical based on Course Code 103 (Python Programming)
Reference Books	As per Course Code 103
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment. 70% External assessment.



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PGDCA 1st Semester

Course: 108: Practical - III

Course Code	108
Course Title	Practical – III
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Practical Work, examination, preparation, holidays etc.)
Effective From	June 2022
Purpose of Course	To understand the Practical concepts of HTML, CSS, JavaScript, and Bootstrap as Front-end Scripting technologies.
Course Objective	To teach the concepts of Front-end Scripting and its practical applications.
Course Outcomes	<ul style="list-style-type: none">• The students will understand the practical aspects of the static web technology like HTML , CSS, and JavaScript.• The students will get trained to represent practical knowledge in the Bootstrap and its components, which will help the students learn static web designing.• The students will get an exposure to the various UI technologies and their practical use in real-world.• After completion of this course, the student will be able to design and develop web pages and Interactive UI for Web Applications.
Course Content	Practical based on Course Code 104 (Introduction to Front End Technologies)
Reference Books	As per Course Codes 104
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment. 70% External assessment.



**Department of Computer Science,
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PGDCA 2nd Semester

Course: 201: Website Development using WordPress

Course Code	201																																			
Course Title	Website Development using WordPress																																			
Credit	4																																			
Teaching per Week	4 Hrs																																			
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																																			
Effective From	June 2022																																			
Purpose of Course	To understand the concepts of WordPress CMS.																																			
Course Objective	To teach the concepts of WordPress.																																			
Course Outcomes	<p>CO1: The students will get the insight of the fundamental aspects of WordPress which has powerful website building features to help publish.</p> <p>CO2: The students will get trained to use different Themes, Widgets, and their functionalities.</p> <p>CO3: The students will get trained to use various Plugins, User management and backup and security of websites.</p> <p>CO4: After completion of this course, the student will be able to design and develop real world web sites using WordPress</p>																																			
Mapping between COs with PSOs	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO2</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO3</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO4</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	CO1							CO2							CO3							CO4						
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CO1																																				
CO2																																				
CO3																																				
CO4																																				
Pre-requisite	Basic concepts of HTML, Web & Programming skills																																			
Course Content	<p>Unit 1. Introduction</p> <ol style="list-style-type: none"> 1.1. Introduction of different Web Technology 1.2. What is WordPress 1.3. How WordPress Works 1.4. Installation of WordPress <ol style="list-style-type: none"> 1.4.1. Installation of server 1.4.2. Installation of WordPress 1.4.3. Installation of MY SQL <p>Unit 2. Themes ,Widgets and Menu</p> <ol style="list-style-type: none"> 2.1. Themes <ol style="list-style-type: none"> 2.1.1. Selection of Themes(free/paid) 2.1.2. Selection process 2.1.3. Adding /Installing Themes 2.1.4. Changing ,Preview and Activation themes 2.2. Widgets <ol style="list-style-type: none"> 2.2.1. Installation of Widgets in sidebar and footer 2.3. Menu for Website <ol style="list-style-type: none"> 2.3.1. Creating menu 																																			



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	<p>2.3.2. Adding pages, categories, and post in menu 2.3.3. Creating Submenu 2.3.4. Deleting from menu and submenu</p> <p>Unit 3. Pages, Posts, Plugins</p> <p>3.1. Pages 3.1.1. Add pages 3.1.2. Edit pages 3.1.3. Delete pages 3.1.4. Publish pages</p> <p>3.2. Posts 3.2.1. Add posts 3.2.2. Edit posts 3.2.3. Delete posts 3.2.4. Publish posts</p> <p>3.3. Plugins 3.3.1. View plugins 3.3.2. Install plugins 3.3.3. Customize plugins</p> <p>Unit 4. Users Administration and Appearance</p> <p>4.1. Users 4.1.1. Add users 4.1.2. Edit users 4.1.3. Delete users 4.1.4. User Rights & Roles</p> <p>4.2. Appearance 4.2.1. Theme management 4.2.2. Customize theme 4.2.3. Widget management</p> <p>Unit 5. Advance WordPress</p> <p>5.1. Host transfer 5.2. Version Update 5.3. Spam Protection 5.4. Backup and Restore 5.5. Settings</p>
Reference Books	<ol style="list-style-type: none"> 1. WordPress 5 Complete- Karol Król · 2019- Packt Publishing 2. WordPress for Beginners 2020 - Andy Williams 2019 – Paperback 3. WordPress 5 Cookbook- Rakhitha Nimesh Ratnayake 2020 - Packt Publishing 4. WordPress Development in Depth - Peter MacIntyre, Sávio Resende 2020 – Paperback 5. WordPress All-In-One for Dummies - Lisa Sabin-Wilson 2019 – Paperback
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



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PGDCA 2nd Semester

Course: 202: Open-Source Web based Technology (PHP/ MySQL)

Course Code	202																																								
Course Title	Open-Source Web based Technology (PHP/ MySQL)																																								
Credit	4																																								
Teaching per Week	4 Hrs																																								
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																																								
Effective From	June 2022																																								
Purpose of Course	To make students aware of Open-Source Web Based Tools and Database.																																								
Course Objective	<ul style="list-style-type: none"> • To make students understand concepts of Open-Source Web Based Dynamic Scripting Language • To make students understand concepts of Open-Source Database 																																								
Course Outcomes	<p>CO1: The students will get idea about the fundamental aspects of the Open-Source Web based Technology PHP and MySQL.</p> <p>CO2: The students will get trained to deal with possible problem while developing websites and its solution.</p> <p>CO3: The students will get an exposure to the analysis and development process of Websites.</p> <p>CO4: The students will be able to understand how Open-source web technology works. They will also be able to create database driven Professional Websites.</p>																																								
Mapping between COs with PSOs	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th></th> <th>PSO1</th> <th>PSO2</th> <th>PSO3</th> <th>PSO4</th> <th>PSO5</th> <th>PSO6</th> </tr> </thead> <tbody> <tr> <td>CO1</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO2</td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <td>CO3</td> <td></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <td>CO4</td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> </tbody> </table>							PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	CO1							CO2							CO3							CO4						
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CO4																																									
Pre-requisite	Basic knowledge of Scripting Language & HTML.																																								
Course Content	<p>Unit 1. Introduction to PHP</p> <p>1.1. Installing and Configuring PHP with MySQL</p> <p>1.2. How PHP code is parsed</p> <p>1.3. Embedding PHP and HTML</p> <p>1.4. Datatypes, Variables and Operators</p> <p>1.5. Arrays in PHP</p> <p>1.6. Control statements in PHP</p> <p style="padding-left: 20px;">1.6.1. Condition Statements</p> <p style="padding-left: 40px;">1.6.1.1. If...Else</p> <p style="padding-left: 40px;">1.6.1.2. Switch</p> <p style="padding-left: 20px;">1.6.2. Loops</p> <p style="padding-left: 40px;">1.6.2.1. While</p> <p style="padding-left: 40px;">1.6.2.2. Do...While</p> <p style="padding-left: 40px;">1.6.2.3. For</p> <p style="padding-left: 40px;">1.6.2.4. For each</p> <p style="padding-left: 20px;">1.6.3. Comments in PHP</p>																																								



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	<p>Unit 2. Working with Data and Functions</p> <ol style="list-style-type: none"> 2.1. FORM element, INPUT elements 2.2. Passing Variables between pages: get, post and request 2.3. Validating the user Input 2.4. Built-in Functions <ol style="list-style-type: none"> 2.4.1. String Functions 2.4.2. Math Functions 2.4.3. Array Functions 2.4.4. Date Functions 2.5. User-defined Functions <p>Unit 3. State Management and File uploading</p> <ol style="list-style-type: none"> 3.1. Session Management: Concept, Storing and Retrieving Session variables, Destroying session variables and session 3.2. Cookie: Concept, Storing, Retrieving and Deleting Cookie 3.3. File uploading 3.4. Restrictions on file upload <p>Unit 4. Working with XML and Images in PHP</p> <ol style="list-style-type: none"> 4.1. Introduction to XML 4.2. Heredoc and Nowdoc String in PHP 4.3. SimpleXML class and its functions 4.4. Introduction to GD Library 4.5. Various built-in Image related functions provided by PHP <p>Unit 5. Database operations in MySQL using PHP</p> <ol style="list-style-type: none"> 5.1. Types of storage engines in MySQL 5.2. DML queries in MySQL 5.3. Database connectivity of PHP with MySQL
Reference Books	<ol style="list-style-type: none"> 1. Core PHP Programming - Leon Atkinson – Pearson Publishers 2. The Complete Reference PHP - Stever Holzner – McGraw Hill 3. Beginning PHP 5.0 Database - Christopher Scollo, Harish Rawat, Deepak Thomas – Wrox Press 4. XML: The Complete Reference- Heather Williamson- McGraw-Hill
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



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PGDCA 2nd Semester

Course: 203: Digital Marketing

Course Code	203
Course Title	Digital Marketing
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)
Effective From	June 2022
Purpose of Course	The program aims at developing an overall understanding of digital marketing / online marketing platforms, mainly web analytics, social media tools, marketing through search engines, search engine optimisation, mobile marketing, email marketing, digital display marketing, content marketing and Strategizing marketing.
Course Objective	<ul style="list-style-type: none">• Understand the search engine as a default entry point to the internet. Learn how to get a website listed among top search engine results.• Measure, monitor and evaluate the website traffic and campaign statistics. Learn how to make business decisions from the metrics available in Digital Media• Delivering the relevant marketing communication to the targeted audience in a most creative way. Learn how to effectively build your users lists, deliver emails & generate relevant clicks. Marrying the offline database with the online database.• Harnessing the strength of social media for marketing. Learn how to build brand preferences, generate leads & aggregate audience on Social Media• Increasing audience engagement through content marketing. Learn to use white paper, brochure, case studies for unique interaction.• Strategizing marketing through smart devices. Learn App-based marketing, QR codes, Location-based marketing, SMS marketing
Course Outcomes	CO1: The students will be able to understand the search engine and learn how to get a website listed among top search engine results. CO2: The students will be able to make business decisions available in digital media by measuring, monitoring, and evaluating the website traffic and campaign statistics. CO3: The students will get trained on how to effectively build your users lists, deliver emails & generate relevant clicks. CO4: The students will learn how to build brand preferences, generate leads, aggregate audience on Social Media, & increase audience engagement through content marketing. CO5: The students will be able to strategize marketing through smartphones using App-based marketing, Location-based marketing, SMS marketing.



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Mapping between COs with PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
	CO1						
	CO2						
	CO3						
	CO4						
	CO5						
Pre-requisite	Nil						
Course Content	<p>Unit 1. Fundamentals</p> <ol style="list-style-type: none"> 1.1. Introduction to WWW 1.2. Understanding Hypertexts & Links 1.3. Fundamentals of Website, Webpage & Home page 1.4. Introduction to New Age Media (Digital) Marketing <ol style="list-style-type: none"> 1.4.1. What is Digital Marketing 1.4.2. Digital vs Real Marketing 1.4.3. Digital Marketing Channels 1.4.4. Types of Digital Marketing - Internet Marketing, Social Media Marketing & Mobile Marketing <p>Unit 2. Initial Digital Marketing Plan</p> <ol style="list-style-type: none"> 2.1. Content Management 2.2. SWOT Analysis: Strengths, Weaknesses, Opportunities & Threats 2.3. Target Group Analysis <p>Unit 3. Search Engine Optimization (SEO)</p> <ol style="list-style-type: none"> 3.1. Introduction 3.2. HTML Optimization 3.3. On Page & Off Page SEO 3.4. Planning SEO for a website 3.5. Content Optimization 3.6. Keyword Search 3.7. Technical SEO 3.8. Local SEO <p>Unit 4. Social Media Marketing</p> <ol style="list-style-type: none"> 4.1. Understanding various Social Media Platforms like Facebook, Twitter, LinkedIn, Instagram, Blogs etc. 4.2. Understanding Social Media Marketing 4.3. Introduction to Web Analytics 4.4. Modes of Social Media Marketing <ol style="list-style-type: none"> 4.4.1. Page Creation on various Social Media Platforms 4.4.2. Advertisement Manager on Various Social Media Platforms 4.4.3. Building Social Media Marketing Strategy <p>Unit 5. Other Modes</p> <ol style="list-style-type: none"> 5.1. E-Mail Marketing <ol style="list-style-type: none"> 5.1.1. Marketing Plan 5.1.2. Marketing Campaign Analysis 5.1.3. Keeping up with the Conversations 5.2. Mobile Marketing 						



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Reference Books	<ol style="list-style-type: none">1. Big Book of Digital Marketing, Publisher: Digital Firefly Marketing2. Understanding Digital Marketing, Marketing Strategies For Engaging the Digital Generation by Damian Ryan, Calvin Jones, Publisher- Kogan Page3. Understanding Digital Marketing- Basics and Actions by Teresa Pineiro-Otero and Xabier Martinez-Rolan, Publisher- Springer International Publishing4. Digital Marketing Strategy, Publisher-Lyfe Marketing5. The Essential Guide to Marketing in a digital world by Rob Stokes, Publisher- Quirk eMarketing6. Digital Marketing for Dummies By Ryan Deiss and Russ Hennesberry7. Advertising and Promotion: An Integrated Marketing Communications Perspective, George Belch, San Diego University Michael Belch, San Diego University8. Advertising Management: Rajeev Batra, John G. Myers, David A. Aaker9. Belch: Advertising & Promotions (TMH)10. The Social Media Bible: Tactics, Tools, & Strategies for Business Success by Lon Safko11. Web Analytics 2.0 – Avinash Kaushik
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



**Department of Computer Science,
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PGDCA 2nd Semester

Course: 204: e-Commerce and Network Security Essentials

Course Code	204						
Course Title	e-Commerce and Network Security Essentials						
Credit	4						
Teaching per Week	4 Hrs						
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)						
Effective From	June 2022						
Purpose of Course	This course is an introduction to students to understand Computer Network concepts and network security fundamentals. The course also gives students an idea about the process of E-commerce and security concerns while using E-commerce in business management.						
Course Objective	<ul style="list-style-type: none"> • To make student understand the nature of computer network and security. • To make student understand the Internet Communication. • To make student understand the nature of e-Commerce. • To make student recognize the business impact and potential of e-Commerce. • To explain the economic consequences of e-Commerce. • To discuss the trends in e-Commerce and the use of the Internet. 						
Course Outcomes	<p>CO1: The students will get an insight on the fundamental aspects of the computer network, Internet, and E-Commerce.</p> <p>CO2: The students will get trained to understand various aspects to deal with the Internet connection like communication devices, PSTN, DSL, Network addressing.</p> <p>CO3: The students will get familiarized with the process of E-commerce and security concerns while using E-commerce in business management.</p> <p>CO4: The students will be able to recognize the business impact and potential of ecommerce and the economic consequence of e-Commerce.</p> <p>CO5: The students will understand the concepts of EPS.</p>						
Mapping between COs with PSOs		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
	CO1						
	CO2						
	CO3						
	CO4						
	CO5						
Pre-requisite	Nil						
Course Content	Unit 1. Networking Fundamentals & Internet Communication 1.1. An Introduction to Networks 1.2. Components to connect computer to network						



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	<p>1.3. Categories of Computer Network – peer-to-peer, client-server, LAN, MAN and WAN</p> <p>1.4. Transmission Categories- Simplex, Half Duplex & Full Duplex</p> <p>1.5. Network Topologies- Bus, Ring, Star, Mesh</p> <p>1.6. Network Addressing- Physical (MAC) & Logical (IP) Address</p> <p>1.7. IPV4</p> <p> 1.7.1.Subnet mask</p> <p> 1.7.2.Network Address Classes- A,B and C</p> <p>1.8. IPV6</p> <p> 1.8.1.Need of IPV6</p> <p> 1.8.2.IPV6 Notation (Hexadecimal & Compressed)</p> <p> 1.8.3.IPV6 Address Structure</p> <p>Unit 2: Network Security Essentials</p> <p>2.1. Need for security</p> <p>2.2. Security Attacks</p> <p>2.3. Firewalls</p> <p>2.4. IP Security</p> <p>Unit 3: Introduction to E-Commerce</p> <p>3.1. History of E-Commerce</p> <p>3.2. Concepts, Advantages and Disadvantages of E-Commerce</p> <p>3.3. Impact of E-Commerce on business</p> <p>3.4. Traditional Commerce and E-Commerce</p> <p>3.5. Types of E-Commerce- b2b,b2c,b2e,b2g,g2b,g2g,g2c,c2c,c2b</p> <p>Unit 4: Electronic Payment Systems</p> <p>4.1. Introduction to EPS</p> <p>4.2. Types of Electronic Payment Systems-Payment card, Digital cash, Digital wallet, Smart card</p> <p>4.3. Online banking (net banking)</p> <p>4.4. Electronic Funds Transfer</p> <p>4.5. Payments on retail sites using credit/debit card, Net banking etc.</p> <p>Unit 5: Case Studies</p> <p>5.1. Travel Segment - IRCTC, GSRTC</p> <p>5.2. Retail Segment - Flipkart, Snapdeal, Amazon, Jabong, Yepme</p> <p>5.3. Whole seller Segment - Alibaba, IndiaMart</p> <p>5.4. Other Segments - Google AdSense, SMC, MyGov India, gujaratindia</p>
Reference Books	<ol style="list-style-type: none">1. Data Communication and Networking – B. Forouzan – MCGrawth Hill2. Computer Networks - A. S. Tanenbaum- PHI Publication3. Networking Complete- 1st Edition 2002, BPB Publication3. Black, “Computer Networks - Protocols, Standard, Interface”, 2nd Edition, Prentice Hall of India4. Business on the net - by Kamlesh N. Agarwal , Amit Lal & Deeksha Agarwal (Macmillan India Ltd.).5. E-Commerce an Indian Perspective (Second Edition) By Pt Joseph, S.J., Prentice-Hall of India6. E-commerce, The cutting edge of Business, K. K. Bajaj & D. Nag-TMH



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	7. Electronic Commerce, David Kosiur-PHI 8. E-Commerce, An Indian perspective, P. T. Joseph
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.



**Department of Computer Science,
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PGDCA 2nd Semester

Course: 205: Practical - IV

Course Code	205
Course Title	Practical – IV
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Practical Work, examination, preparation, holidays etc.)
Effective From	June 2022
Purpose of Course	To understand the concepts of WordPress and its fundamentals.
Course Objective	To teach the concepts of WordPress so students will be able to design and develop real world web sites using WordPress.
Course Outcomes	<ul style="list-style-type: none">• The students will understand Practical aspects of the WordPress which has powerful website building features to help publish.• The students will get practically trained to understand the different Themes, Widgets, and its functioning.• The students will get practically trained to understand various Plugins, User management and backup and security of website.• After completion of this course, the students will be able to design and develop real world web sites using WordPress.
Course Content	Practical based on Course Code 201 (Website Development using WordPress)
Reference Books	As per Course Codes 201
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment. 70% External assessment.



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PGDCA 2nd Semester

Course: 206: Practical - V

Course Code	206
Course Title	Practical – V
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Practical Work, examination, preparation, holidays etc.)
Effective From	June 2022
Purpose of Course	This course helps students to understand Practical Knowledge of Open-Source web-based programming PHP and MYSQL.
Course Objective	<ul style="list-style-type: none">• To make students understand practical concepts of PHP.• To make students understand concepts of MySQL.
Course Outcomes	<ul style="list-style-type: none">• The students will understand the Practical aspects of the Open-Source Web based Technology PHP and MySQL.• The students will get trained to deal with possible problems and their solutions while developing websites.• The students will get an exposure with the analysis and development process of Websites..• After studying the course, students will be able to understand how Open-source web technology works. They will also be able to create database driven Professional Websites.
Course Content	Practical based on Course Code 202 (Open-Source Web based Technology (PHP/MySQL))
Reference Books	As per Course Codes 202
Teaching Methodology	Lab Work
Evaluation Method	30% Internal assessment. 70% External assessment.



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PGDCA 2nd Semester

Course: 207: Project

Course Code	207
Course Title	Project
Credit	8
Teaching per Week	--
Minimum weeks per Semester	15 (Including Project Work, examination, preparation, holidays etc.)
Effective From	June 2022
Purpose of Course	The project work is introduced to make students implement their theory and practical knowledge they learned during this degree course to solve real life problem related to the industry, academic institutions or other organization. It involves practical work for understanding and solving problems in the field of computing
Course Objective	To help students develop their practical ability and knowledge about practical tools/techniques in order to develop software.
Prerequisite	Knowledge of programming methodology and GUI tools
Course Outcomes	Student will be able to develop software applications.
Course Content	<ul style="list-style-type: none">• The students are required to carry out project during the semester.• At the end of the semester, the students have to submit their project report in bounded form as per guidelines given by the department.• The project report and project completion certificate is mandatory for appearing in Project Presentation and Viva – Voce.
Reference Books	---
Teaching Methodology	Project Guidance, Review
Evaluation Method	100% assessment is based on the Project Presentation and Viva – Voce as conducted as per the University exam schedule.