

Re-Accredited 'B++' 2.86 CGPA by NAAC
VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

Tel : +91 - 261 - 2227141 to 2227146, Toll Free : 1800 2333 011, Digital Helpline No. - 0261 2388888
E-mail : info@vnsgu.ac.in, Website : www.vnsgu.ac.in

ક્રમાંક : એસ/પરિપત્ર/સિલેબસ/૫૦૩૩/૨૦૨૪
તા.૦૭/૦૩/૨૦૨૪

પ્રતિ,
વડાશ્રી,
જે.પી.દાવર ઇન્સ્ટીટ્યુટ ઓફ ઇન્ફોમેશન
સાયન્સ એન્ડ ટેકનોલોજી,
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી,
સુરત.

વિષય :— બી.એસસી. (આઈ.ટી.) સેમે.—૩ અને ૪ ના સ્ટ્રક્ચર અને અભ્યાસક્રમ બાબત.

મહાશય,

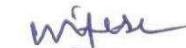
સવિનય જણાવવાનું કે, NEP-2020 અંતર્ગત શૈક્ષણિક વર્ષ ૨૦૨૪-૨૫ થી અમલમાં આવનાર B.Sc.(IT)Sem.-3 & 4નું સ્ટ્રક્ચર અને અભ્યાસ સમિતિ દ્વારા નિયુક્ત પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ Major, Minor, MDC અને SEC ના અભ્યાસક્રમ સંદર્ભે ઇન્ફોમેશન ટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા. ૧૨/૦૨/૨૦૨૪ની સભાના ઠરાવ ક્રમાંક :૨અન્વયે નીચે મુજબ કરેલ ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઇન્ફોમેશન ટેકનોલોજી વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખા સાયન્સ એન્ડ ઇન્ફોમેશન ટેકનોલોજી વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા. ૦૧/૦૩/૨૦૨૪ની સભાના ઠરાવ ક્રમાંક :૨

ઇન્ફોમેશન ટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા. ૧૨/૦૨/૨૦૨૪ ની સભાના ઠરાવ ક્રમાંક :૨
:: આથી ઠરાવવામાં આવે છે કે, NEP-2020 અંતર્ગત શૈક્ષણિક વર્ષ ૨૦૨૪-૨૫ થી અમલમાં આવનાર બી.એસસી. (આઈ.ટી.) સેમેસ્ટર-૩ અને ૪ નું સ્ટ્રક્ચર અને પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ Major, Minor, MDC અને SEC નો અભ્યાસક્રમ સર્વાનુમતે મંજૂર કરી કોમ્પ્યુટર સાયન્સ એન્ડ ઇન્ફોમેશન ટેકનોલોજી વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા. ૦૧/૦૩/૨૦૨૪ની સભાના ઠરાવ ક્રમાંક : ૦૪

:: આથી ઠરાવવામાં આવે છે કે, NEP-2020 અંતર્ગત શૈક્ષણિક વર્ષ ૨૦૨૪-૨૫ થી અમલમાં આવનાર B.Sc.(IT) Sem.-3 & 4 નું સ્ટ્રક્ચર અને અભ્યાસ સમિતિ દ્વારા નિયુક્ત પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ Major, Minor, MDC અને SEC ના અભ્યાસક્રમ સંદર્ભે ઇન્ફોમેશન ટેકનોલોજી વિષયની અભ્યાસ સમિતિની તા. ૧૨/૦૨/૨૦૨૪ ની સભાના ઠરાવ ક્રમાંક :૨ અન્વયે નીચે મુજબ કરેલ ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઇન્ફોમેશન ટેકનોલોજી વિદ્યાશાખાના અધ્યક્ષશ્રીએ મંજૂરીની અપેક્ષાએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ સ્વીકારી મંજૂર કરવામાં આવે છે.

નિર્ણય: ઉપર મુજબ


કુલસચિવ ૮૮૧

પ્રતિ,

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

Veer Narmad South Gujarat University, Surat

Date: 31/03/2024
Page No. 5

Program Structure: S. Y. B. Sc. (I. T.) / M. Sc. (I. T.) (SEM – 3 and SEM – 4)

(w.e.f. Academic Year June, 2024-2025)

Bachelor of Science in Information Technology (B. Sc. (I. T.)) – Three Year Program

Bachelor of Science in Information Technology (B.Sc. (I.T.) (Hon.)) – Four Year Integrated Program

Master of Science in Information Technology (M.Sc. (I.T.)) – Five Year Integrated Program

Name of Program	Master of Science (Information Technology)																																																
Abbreviation	M.Sc. (I.T.)																																																
Eligibility	H S C / Equivalent Examination from Science Stream (A / B / AB Group) or Vocational Stream or General Stream (Commerce) with English as one of the subject.																																																
Objective of Program	The objective of the program is to transform students into I.T. professionals by providing them advanced technical knowledge and outstanding placement in reputed I.T. companies.																																																
Program Outcome	<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> <p>PO7 : Team Work 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	<p>PSO1: Students will learn to develop and strengthen the fundamental concepts that are required to solve complex programming problems.</p> <p>PSO2: Students will develop the ability to identify, formulate and design solutions to face computational challenges.</p> <p>PSO3: Students will be able to apply software engineering concepts to solve real world problems.</p> <p>PSO4: Students will be able to learn emerging technologies and apply them for the development of Web applications, Mobile application, Desktop application, etc.</p> <p>PSO5: Students will develop necessary Entrepreneur and Technical skills to start their own business in I.T domain.</p>																																																
Mapping between POs and 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> </tr> </thead> <tbody> <tr> <td>PO1</td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PO2</td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PO3</td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> <tr> <td>PO4</td> <td></td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>PO5</td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> </tr> <tr> <td>PO6</td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> </tr> <tr> <td>PO7</td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> <td></td> </tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	PO1						PO2						PO3						PO4						PO5						PO6						PO7					
	PSO1	PSO2	PSO3	PSO4	PSO5																																												
PO1																																																	
PO2																																																	
PO3																																																	
PO4																																																	
PO5																																																	
PO6																																																	
PO7																																																	
Medium of Instruction	English																																																
Program Passing Rules	As per University rules																																																

P. V. Patel

Veer Narmad South Gujarat University, Surat

Program Structure: S. Y. B. Sc. (I. T.) / M. Sc. (I.T.) (SEM – 3 and SEM – 4)

(w.e.f. Academic Year June, 2024-2025)

Bachelor of Science in Information Technology (B. Sc. (I. T.)) – Three Year Program

Bachelor of Science in Information Technology (B.Sc. (I.T.) (Hon.)) – Four Year Integrated Program

Master of Science in Information Technology (M.Sc. (I.T.)) – Five Year Integrated Program

SEMESTER – 3

Course Code	Course Title	Course Category	Level of Course	Course Credits	Teaching Hours/week	University Exam Type	Exam Duration	External Marks	Internal Marks	Total Marks
301	IT Business Communication - I	Ability Enhancement Course	200-299 Intermediate	2	2	0	Theory/ Written	1 Hrs	25	25
302	Fundamental of Electronics	Multi-Disciplinary Course	200-299 Intermediate	4	4	0	Theory/ Written	2 Hrs	50	50
303	Data Structures	Major Course	200-299 Intermediate	4	4	0	Theory/ Written	2 Hrs	50	50
304	Object Oriented Programming	Major Course	200-299 Intermediate	4	4	0	Theory/ Written	2 Hrs	50	50
305	Practical – 3	Major Course	200-299 Intermediate	4	0	8	Practical	4 Hrs	50	50
306	Computer Network (SEC-3)	Skill Enhancement Course	-	2	2	0	Theory/ Written	1 Hrs	25	25
307	Value Added Course – 3	Value Added Course	-	2	2	0	As per need of the course	1 Hrs	25	50
Total				22	18	8				550

P. Y. Dholakia

Veer Narmad South Gujarat University, Surat

Program Structure: S. Y. B. Sc. (I. T.) / M. Sc. (I. T.) (SEM – 3 and SEM – 4)

(w.e.f. Academic Year June, 2024-2025)

Bachelor of Science in Information Technology (B. Sc. (I.T.)) – Three Year Program

Bachelor of Science in Information Technology (B.Sc. (I.T.) (Hon.)) – Four Year Integrated Program

Master of Science in Information Technology (M.Sc. (I.T.)) – Five Year Integrated Program

Practical:

- Batch Size – 30 Maximum (Desirable). Maximum 45 students can be accommodated in a batch. Separate batches should be considered if the student strength exceeds 45 numbers.

Summer Internship: A student who wishes to exit after successfully completion of Second year (Semester-1 to Semester-4) without any backlog is required to obtain 4 credits at the end of the year through the 2 months summer internship. For summer training, the Institute/college will grant the permission and evaluate the training outcomes. Based on satisfactory completion of the summer training, the Institute head will recommend to the university to grant four credits for summer training.

Skill Enhancement Course: As per NEP (National Education Policy-2020), it is mandatory for students to select a 2 credit skill enhancement course out of the choices given by the college/institute.

Value Added Course: As per NEP (National Education Policy-2020), it is mandatory for students to select a 2 credit Value Added Course out of the choices given by the college/institute.



B. Sc. (I.T.) 3rd Semester

Course : 301: IT Business Communication 1

Course Code	301																								
Course Title	IT Business Communication 1																								
Credit	2																								
Teaching per Week	2Hrs																								
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)																								
Last Review / Revision	June 2024																								
Purpose of Course	To make the Students Industry ready Professionals																								
Course Objective	To make the students aware about the IT Related business communication.																								
Course Outcomes	<p>CO1: Students will be aware about the Needs and requirements in IT Placements.</p> <p>CO2: Students will be able to enhance their key vocabulary via English for specific purpose (ESP) -English for IT</p> <p>CO3: Students will develop their language skills as per the Industry standards.</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></tr> </thead> <tbody> <tr> <td>CO1</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>CO2</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>CO3</td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	CO1						CO2						CO3					
	PSO1	PSO2	PSO3	PSO4	PSO5																				
CO1																									
CO2																									
CO3																									
Pre-requisite	Basic knowledge of English and communication skills																								
Course Content	<p>Unit : 1 : Group Discussion</p> <p>1.1 Meaning and essentials 1.2 Types of group discussion 1.3 Participating in a GD 1.4 Body Language during a GD 1.5 Expressions used during a GD 1.6 Group Discussions on Different topics (Practical)</p> <p>Unit : 2 :Meeting communication</p> <p>2.1 Agenda and Minutes 2.2 Preparation for a meeting 2.3 Participating in a meeting 2.4 Expressions used in a meeting</p> <p>Unit : 3 : Customer/Client Communication</p> <p>3.1 Basics of Customer communication 3.2 Communicating Empathetically 3.3 Asking questions to understand Problems 3.4 Denying Requests</p>																								

	<p>3.5 Conversations/Expressions based on client communication</p> <p>Unit : 4 :Developing a Professional work ethic:</p> <p>4.1 Demonstrating your work ethic and commitment 4.2 Being Dependable and Reliable 4.3 Earning Recognition 4.4 Developing Professional Work Ethics</p> <p>Unit 5:English for Information Technology:</p> <p>5.1 Language Tasks Based on:</p> <p>5.1.1 IT jobs and duties 5.1.2 IT business and products 5.1.3 IT Operations 5.1.4 Networks</p>
Reference Books	<p>1.Alex, K. Soft Skills : Know Yourself and Know the World. S. Chand & Company Pvt. Ltd., 2014.</p> <p>2.Anand, Renu, and Neena Kaul. Communicative English Resource Book. Oxford University Press, 2018.</p> <p>3.Butterfield, Jeff. Soft Skills for Everyone. Cengage Learning, 2014.</p> <p>4Glendinning, Eric H. and John McEwan. Oxford English for Information Technology. Oxford, University Press, 2002.</p> <p>5.Hill, David. English for Information Technology. Pearson.</p> <p>6.Krasnenko, Oksana, et al. Professional English in IT B2-C1 : Textbook for Students of Information Technology. Taras Shevchenko National University of Kyiv, 2019.</p> <p>7.Meyer, Carolyn, and N. Bringi Dev. Communicating for Results. Oxford University Press, 2021.</p> <p>8.Mishra, Sunita, and C. Muralikrishna. Communication Skills for Engineers. Dorling Kindersley (India) Pvt. Ltd., 2007.</p> <p>9..Mukerjee, Hory Sankar. Business Communication : Connecting at Work. Oxford University Press, 2021.</p> <p>10.Raman, Meenakshi, and Sangeeta Sharma. Professional Communication. Oxford University Press, 2017.</p> <p>11..Ramesh, Gopalaswamy, and Mahadevan Ramesh. The ACE of Soft Skills : Attitude, Communication and Etiquette for Success. Dorling Kindersley (India) Pvt. Ltd., 2013.</p>
Teaching Methodology	Lectures, Discussion, Practical sessions, Seminars, Case Studies,Language Lab sessions and Assignments

B.Sc. (I.T.) 3rd Semester

Course : 302 : Fundamental of Electronics

Course Code	302																													
Course Title	Fundamental of Electronics																													
Credit	4																													
Teaching per Week	4 Hrs																													
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																													
Last Review / Revision	June 2024																													
Purpose of Course	To impart knowledge of electronics devices in Information technology																													
Course Objective	An understanding of basics of electronic and digital circuits.																													
Course Outcomes	CO1 : Students will be able to learn about Electronics components and Application of Electronic circuits . CO2 : Students will be able to learn about Digital Electronics concepts and its application in digital Arithmetic circuitry. CO3 : Students will be able to learn about the Digital Sequential circuits and its application.																													
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> </tr> </thead> <tbody> <tr> <td>CO1</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO2</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CO3</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							PSO1	PSO2	PSO3	PSO4	PSO5	CO1						CO2						CO3					
	PSO1	PSO2	PSO3	PSO4	PSO5																									
CO1																														
CO2																														
CO3																														
Pre-requisite	NIL																													
Course Content	Unit : 1 : fundamental of electrical engineering 1.1 Introduction of Voltage, Current, Power, Phase and Frequency 1.2 Ideal Volt source & Ideal current source,, 1.3 Ohm's Law & Kirchhoff's laws 1.4 Electromagnetism 1.4.1 Magnetic Flux, Flux density, Magnetic force and permeability 1.4.2 Electromagnetic Induction and transformer 1.4.3 Heating effect due to current and need of fuses Unit : 2 : fundamental of electronics components and semiconductor physics 2.1 Passive components and circuits 2.1.1 Introduction of Resistor, capacitor, Inductor 2.1.2 Series & parallel connection of resistors & capacitors 2.2 Active components 2.2.1 different type of Diodes 2.2.2 Transistors, FET and MOSFET																													

P. M. Dugar

	<p>2.3 Introduction of Electronics circuits</p> <ul style="list-style-type: none"> 2.3.1 Power supply: rectifier and simple filter circuits 2.3.2 oscillator 2.3.3 voltage regulator 2.3.4 Amplifier, 2.3.5 switches and relay <p>Unit : 3 : fundamental of Digital Electronics</p> <ul style="list-style-type: none"> 3.1 Introduction of Different Logic gates, 3.2 Interchangeability bubbled gates, 3.3 Demorgan's theorem & Duality theorem, 3.4 Universal gates 3.5 product of sum and sum of product method 3.6 Karnaugh map & it's simplification. 3.7 NAND-NAND ckts and NOR - NOR circuits <p>Unit : 4 : Data processing and Arithmetic circuits</p> <ul style="list-style-type: none"> 4.1 Multiplexers and De-multiplexers 4.2 Decoders and Encoders 4.3 parity generator and checkers 4.4 Half adder, full adder , adder - subtracter circuits <p>Unit : 5 : Sequential circuits</p> <p>5.1 FLIP FLOPS:</p> <ul style="list-style-type: none"> 5.1.1 Construction of flip flops using different gates 5.1.2 RS, D,J-K flip-flop, 5.1.3 JK master slave concept. <p>5.2 Shift Registers and counters:</p> <ul style="list-style-type: none"> 5.2.1 study of shift Registers 5.2.2 Synchronous counter and Asynchronous counter <p>Mod counters.</p>
Reference Books	<ol style="list-style-type: none"> 1. Principal of Electrical and Electronics by V.K. Mehta, S.Chand Limited,1998 2. Digital design, M. Morris Mano, Prentice Hall,2002 3. Basic Electronics by B.L.Theraja, S. Chand Limited,2007 4. Digital electronics, Anil Kumar Maini, Wiley,2007 5. Digital principals and applications by Donald P. Leach ,Albert Paul, Malvino,Tata McGraw-Hill,2010 6. Fundamental of Electronic Engineering by Rajendra Prasad, Cengage Learning,2012 7. Digital Electronics: A Practical Approach with VHDL, 9th edition, William Kleitz,pearson,2012 8. Basic Electronics, D P Kothari, I J Nagrath, McGraw-Hill Education,2013 9. Digital Electronics 1: Combinational Logic Circuits,Tertulien Ndjountche, Wiley-ISTE,2016 10. Digital Electronics 3: Finite-state Machines. Tertulien Ndjountche, Wiley-ISTE,2016 11. Digital Systems, 12th edition, Ronald J. Tocci, Neal S. Widmer, Greg Moss, pearson,2017 12. Digital Fundamentals, 11th edition,Thomas L Floyd,pearson,2017 13. Electronics: Principles and Applications, Charles Schuler, McGraw-Hill

P. M. D. M. A.

	Education,2018 14. Electronic Circuits, Fundamentals and Applications, Mike Tooley CRC Press,2019 15. Fundamentals of Digital Electronics, Dhanasekharan Natarajan, Springer Nature Switzerland AG,2020 16. Electronic Principles, Albert Paul Malvino, David J. Bates, Patrick E. Hoppe,McGraw-Hill Education,2020 17. Grob's Basic Electronics, Mitchel E. Schultz,McGraw-Hill Education; 13thedition ,2020 Digital Electronics: Principles and Applications, Roger Tokheim and Patrick Hoppe, McGraw-Hill Education,2021
Teaching Methodology	Lectures, Discussion, Self Study, Seminars, Case Study and Assignment

P. M. D. 2021

B.Sc. (I.T.) 3rd Semester

Course : 303 : Data Structures

Course Code	303																								
Course Title	Data Structures																								
Credit	4																								
Teaching per Week	4 Hrs																								
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)																								
Last Review / Revision	June 2024																								
Purpose of Course	To introduce the basic concepts of data structures and algorithms involving linear and non-linear data structures and their logical implementation.																								
Course Objective	To teach fundamental concepts of data structures including stack, queue, linked list, tree and various sorting, searching techniques. This course also entails practical aspect of applications of data structures.																								
Course Outcomes	<p>CO1 : Students will be able to learn data structure techniques and algorithms used for solving complex problems</p> <p>CO2 : Students will be able to learn linear data structure and non-linear data structure algorithms</p> <p>CO3 : Students will be able to learn working of various sorting and searching algorithms</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></tr> </thead> <tbody> <tr> <td>CO1</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>CO2</td><td></td><td></td><td></td><td></td><td></td></tr> <tr> <td>CO3</td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	CO1						CO2						CO3					
	PSO1	PSO2	PSO3	PSO4	PSO5																				
CO1																									
CO2																									
CO3																									
Pre-requisite	Fundamentals of Computer, C Programming Language																								
Course Content	<p>Unit : 1 : Introduction</p> <p>1.1 Definition and Classification 1.2 Importance of data structures 1.3 Data Structure Operations 1.4 Analysis of Algorithms, Algorithm Complexity 1.5 Time-Space Trade off, Big-O, omega and theta Notation 1.6 Best case Time Complexity, Average case Time Complexity, Worst case Time Complexity</p> <p>Unit : 2 : Linear Data Structures</p> <p>2.1 Array: Storage, mapping and applications 2.2 Stack 2.2.1 Concept and Definition 2.2.2 Operations 2.2.3 Applications of stack 2.2.4 Polish Expression 2.2.5 Infix, Prefix and Postfix Notation 2.2.6 Converting Infix to Postfix Notation 2.2.7 Expression Evaluation</p>																								

P. Y. D. S. A.

- | | |
|--|--|
| | <ul style="list-style-type: none"> 2.2.8 Recursion and Tower of Hanoi Problem 2.3 Queue 2.3.1 Concept and Definition 2.3.2 Types of Queue 2.3.3 Simple Queue 2.3.4 Circular Queue 2.3.5 Double ended Queue 2.3.6 Priority Queue 2.3.7 Operations on all queues 2.3.8 Applications of queue
 2.4 Linked List 2.4.1 Concept and Definition 2.4.2 Types of Linked list 2.4.3 Singly Linked List 2.4.4 Circular Linked List 2.4.5 Doubly Linked List 2.4.6 Circular Doubly Linked List 2.4.7 Header Linked List 2.4.8 Operations on linked list 2.4.9 Applications of linked list 2.4.10 Polynomial Manipulation |
|--|--|

Unit : 3 : Non Linear Data Structures

- 3.1 Tree
- 3.1.1 Introduction and Representation
- 3.1.2 General Tree
- 3.1.3 Binary Tree
- 3.1.4 Threaded and linked storage representation of Binary Tree
- 3.1.5 Operations on Binary Tree
- 3.1.6 Binary Tree Traversals
- 3.1.7 Binary Search Tree
- 3.1.8 Height-Balanced Tree: AVL tree
- 3.1.9 Splay Tree
- 3.1.10 Applications of tree: Expression Tree
- 3.1.11 Symbol table and Syntax Analysis

Unit : 4 : Searching Techniques

- 4.1 Searching
- 4.1.1 Linear Search
- 4.1.2 Binary Search
- 4.1.3 Hashing
- 4.1.3.1 Hash Tables
- 4.1.3.2 Hash Functions and Hash Keys
- 4.1.3.3 Collision and Collision Resolution
- 4.1.3.4 Rehashing

P. M. DOSTAM

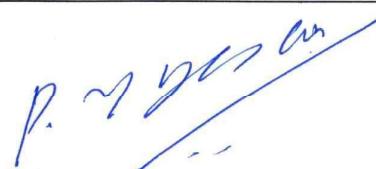
	<p>5.1 Sorting Techniques</p> <p>5.1.1 Bubble sort 5.1.2 Selection sort 5.1.3 Insertion sort 5.1.4 Shell sort 5.1.5 Merge sort 5.1.6 Quick sort 5.1.7 Radix sort 5.1.8 Heap Sort</p>
Reference Book	<ol style="list-style-type: none"> 1. An Introduction to Data Structures with applications – Trembley, Sorenson – TMH 2. Theory and problems of data structures – Seymour Lipschutz – TMH 3. Data Structures and Algorithms in C++ - Michael T. Goodrich, Roberto Tamassai, David M. Mount – Wiley 4. Fundamentals of Data Structures in C, Horowitz, Sahni, Anderson-Freed - W. H. Freeman & Co. New York, NY, USA 5. Data Structures & Algorithms, A V Aho, J E Hopcroft, J D Ullman - Addison-Wesley Publishing 6. Data Structure & "C" Programming - Vanwyte CJ - Addison Wesley. 7. Data Structures, Algorithms And Object Oriented Programming – TMH edition Geogory L. Heileman. 8. Data Structures using C & C++ - Y. Langsam Moshe J. Angensterin & A.M.Terenbanm
Teaching Methodology	Lectures, Discussion, Self Study, Seminars, Case Study and Assignment

P. M. Dector

B.Sc. (I.T.) 3rd Semester

Course : 304 : Object Oriented Programming

Course Code	304																								
Course Title	Object Oriented Programming																								
Credit	4																								
Teaching per Week	4 Hrs																								
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)																								
Last Review / Revision	June 2024																								
Purpose of Course	To impart knowledge of object-oriented programming concepts																								
Course Objective	To make student learn the concepts of Object-Oriented Programming																								
Course Outcomes	<p>CO1 : Students will be able to learn Object Oriented programming concepts.</p> <p>CO2 : Students will be able to learn object oriented programming concepts like data abstraction, inheritance, polymorphism using C++</p> <p>CO3 : Students will be able to learn I/O operation on files using IO streams and exception handling using C++.</p>																								
Mapping between COs with PSOs	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th></th><th>PSO1</th><th>PSO2</th><th>PSO3</th><th>PSO4</th><th>PSO5</th></tr> <tr> <td>CO1</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>CO2</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td><td></td><td></td><td></td></tr> <tr> <td>CO3</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td><td></td><td></td><td></td></tr> </table>		PSO1	PSO2	PSO3	PSO4	PSO5	CO1						CO2						CO3					
	PSO1	PSO2	PSO3	PSO4	PSO5																				
CO1																									
CO2																									
CO3																									
Pre-requisite	C Programming																								
Course Content	<p>Unit : 1 : Basic concepts of object oriented of programming</p> <p>1.1 Background</p> <ul style="list-style-type: none"> 1.1.1 Procedure Oriented Programming Vs Object Oriented Programming 1.1.2 Basic Concepts of Object Oriented Programming 1.1.3 Benefits of Object Oriented Programming <p>1.2 Classes & Objects</p> <ul style="list-style-type: none"> 1.2.1 Specifying a class 1.2.2 Defining member functions 1.2.3 Inline function 1.2.4 Nesting of member functions 1.2.5 Private member function 1.2.6 Static data members 1.2.7 Static member functions 1.2.8 Friend functions 1.2.9 Returning objects 1.2.10 Pointers to members <p>1.3 Constructors & Destructors</p> <ul style="list-style-type: none"> 1.3.1 Constructors 1.3.2 Parameterized constructors 1.3.3 Multiple constructors in a class 1.3.4 Constructors with default arguments 																								



P. M. Yousuf

	<p>1.3.5 Copy constructors 1.3.6 Dynamic constructors 1.3.7 Const objects 1.3.8 Destructors.</p> <p>Unit : 2: Inheritance & Polymorphism</p> <p>2.1 Inheritance</p> <ul style="list-style-type: none"> 2.1.1 Defining derived class using single base class 2.1.2 Derivation using public 2.1.3 Private and protected access modifiers 2.1.4 The implementation of inheritance in the C++ object model 2.1.5 The multiple-inheritance, Abstract classes 2.1.6 Composite objects (container objects) <p>2.2 Compile Time Polymorphism</p> <ul style="list-style-type: none"> 2.2.1 Function Overloading 2.2.2 Unary Operators 2.2.3 Binary Operators 2.2.4 Using Friends as operator functions <p>2.2.5 Overloading other Operators</p> <p>2.2.6 User defined conversion</p> <p>2.2.7 Four different cases of user defined conversions</p> <p>2.2.8 Comparison of both the methods of conversion</p> <p>2.3 Run Time Polymorphism</p> <ul style="list-style-type: none"> 2.3.1 Pointers to objects 2.3.2 this pointer 2.3.3 Pointers to derived classes 2.3.4 Virtual functions 2.3.5 Pure virtual functions. <p>Unit : 3: I/O Streams and Files</p> <p>3.1 I/O Streams</p> <ul style="list-style-type: none"> 3.1.1 Introduction to stream 3.1.2 Advantages of using C++ I/O over C I/O 3.1.3 The C++ Predefined streams 3.2.4 Formatting I/O 3.1.5 Formatting using I/Os members 3.1.6 Manipulators, Creating our own manipulator <p>3.2 Data Files</p> <ul style="list-style-type: none"> 3.2.1 Introduction to File I/O 3.2.2 Text and binary streams 3.2.3 Opening and closing files 3.2.4 Text files 3.2.5 Binary files 3.2.6 Providing Random Access using seek <p>3.3 I/O Modes Handling Errors</p> <p>Unit 4: Exception Handling</p> <ul style="list-style-type: none"> 4.1 Introduction 4.2 Basics of Exception Handling 4.3 Exception Handling Mechanism 4.4 Throwing Mechanism 4.5 Catching Mechanism 4.6 Rethrowing an Exception
--	---

P. M. Doss

	<p>Unit : 5 Templates</p> <p>5.1 Function Templates 5.2 Non Generic (Non Type) Parameters in Template functions 5.3 Template function and specialization 5.4 Overloading a template function 5.5 Using Default Arguments 5.6 Class Templates 5.7 Classes with multiple generic data types 5.8 Static data members 5.9 Primary and Partial Specialization 5.10 The Export Keyword. 5.11 Standard Template Library (STL) 5.11.1 Algorithms 5.11.2 Containers 5.11.3 Functions 5.11.4 Iterators</p>
Reference Book	<ol style="list-style-type: none"> 1. Object Oriented Programming with C++: Balagurusamy - TMH 2. OOP in Turbo C++: Robert Lafore - Galgotia Publication 3. C++ Primer :Lippman - Addison Wesley 4 . Object Oriented Programming Fundamentals & Applications: Probal Sengupta - PHI 5. The Complete Reference: Schildt - Osborne 6. The C++ Programming Language: Stroustrup - Addison Wesley 7. Object Oriented Analysis & Design with Application, Grady Booch, LPE 8. Standard C++ with Object Oriented Programming, Paul S. Wang, Thomson
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment

P. V. Dutt


B.Sc. (I.T.) 3rd Semester

Course : 305 : Practical 3

Course Code	305																								
Course Title	Practical 3																								
Credit	4																								
Teaching Per Week	8 Hrs																								
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)																								
Last Review/Revision	June 2024																								
Purpose of Course	To impart practical knowledge of implementation of data structures and OOP principles																								
Course Objective	To give practical knowledge on applications of data structures and usage of object oriented programming																								
Prerequisite	Basic knowledge of C programming language																								
Course Out comes	CO1 : Students will be able to develop programs of linear and nonlinear data structures. CO2 : Students will be able to solve problems using object oriented programming with C++. CO3 :Students will be able to write programs of data structures and programs of C++ with inheritance, polymorphism and other features.																								
Mapping between COs with PSOs	<table border="1"><tr><td></td><td>PSO1</td><td>PSO2</td><td>PSO3</td><td>PSO4</td><td>PSO5</td></tr><tr><td>CO1</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO2</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CO3</td><td></td><td></td><td></td><td></td><td></td></tr></table>		PSO1	PSO2	PSO3	PSO4	PSO5	CO1						CO2						CO3					
	PSO1	PSO2	PSO3	PSO4	PSO5																				
CO1																									
CO2																									
CO3																									
Pre-requisite	Basic knowledge of C programming																								
Course Content	Practical based on Paper No. 303 Data Structures and Paper No. 304 Object oriented programming Weightage: 50% based on Paper No 303 50% based on Paper No 304																								
Reference Books	NIL																								
Teaching Methodology	Lab Work, Assignments																								

P. V. D. S. A.

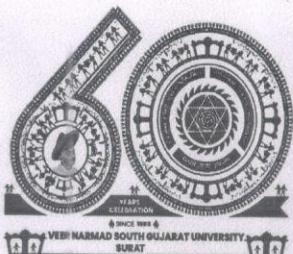
B.Sc. (I.T.) 3rd Semester
Skill Enhancement Course
Course : 306 : Computer Network

Course Code	306																												
Course Title	Computer Network																												
Credit	2																												
Teaching per Week	2 Hrs																												
Minimum weeks per Semester	15 (Including Classwork, examination, preparation, holidays etc.)																												
Effective From	June 2024																												
Purpose of Course	To provide fundamental knowledge of Computer Network																												
Course Objective	To Impart fundamental Knowledge of Computer Network																												
Course Outcomes	CO1 : Students will be able to learn about how computers can connect with each other using networks. CO2 : Students will be able to learn about computer network communication layers. CO3 : Students will be able to learn about basics of computer network security.																												
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> </tr> </thead> <tbody> <tr> <td>CO1</td> <td style="background-color: #cccccc;"></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 style="background-color: #cccccc;"></td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td>CO3</td> <td></td> <td></td> <td></td> <td style="background-color: #cccccc;"></td> <td></td> </tr> </tbody> </table>						PSO1	PSO2	PSO3	PSO4	PSO5	CO1						CO2						CO3					
	PSO1	PSO2	PSO3	PSO4	PSO5																								
CO1																													
CO2																													
CO3																													
Pre-requisite	Basic computer knowledge																												
Course Content	Unit : 1 : Introduction to Networks 1.1 Data Communications: components 1.2 Direction of data flow, 1.3 Networking – Concepts, 1.4 Need, Uses and advantages of Network, 1.5 Categories of networks, 1.6 Client, Servers and Peers based and Hybrid Networks, 1.7 Topologies, 1.8 Review of protocols, 1.9 Models and implementations 1.10 Transport and Internet protocols Unit : 2 : Introduction to Network Model 2.1 Introduction 2.1.1 Introduction to OSI Model 2.1.2 Introduction to TCP Model 2.1.3 The OSI Model layer functions 2.2 Introduction to Physical Layer 2.2.1 Data and Signals, 2.2.2 Digital Transmission, 2.2.3 Analog transmission, 2.2.4 Bandwidth, 2.2.5 Transmission Media, 2.2.6 Switching, 2.2.7 IEEE 8.2 Standards 2.3 Data Link Layer 2.3.1 Functions of Data link layer, 2.3.2 Error detection and correction, 2.3.3 Error detection and correction codes, 2.3.4 Data link control and protocols, 2.3.5 Multiple access protocol: CSMA/CD, LAN: Ethernet, 2.3.6 Introduction : Wireless LAN, Connecting devices: Repeaters.																												

P. V. yes ✓

	<p>Hubs, Bridges, switches, Concept of VLAN</p> <p>Unit : 3 : Introduction to Network, Transport, Session, Application Layer</p> <p>3.1 Network Layer</p> <ul style="list-style-type: none"> 3.1.1 Introduction to Network Layer 3.1.2 Connection-less service, 3.1.3 Connection oriented service, 3.1.4 Inter-networking, addressing, 3.1.5 Routing algorithms (Distance vector, Link state), 3.1.6 Introduction to Network layer in internet: Logical addressing, 3.1.7 IP protocol, IP address, 3.1.8 Classes of IP addresses, 3.1.9 Routers, Gateways <p>3.2 Transport Layer</p> <ul style="list-style-type: none"> 3.2.1 Transport Service Primitives, 3.2.2 Addressing, connection establishment, flow control, 3.2.3 Multiplexing, 3.2.4 Introduction to transport layer protocols and their features. <p>3.3 Session Layer</p> <ul style="list-style-type: none"> 3.3.1 Introduction to : Establishing Session, 3.3.2 Presentation with Content Encoding and Decoding, 3.3.3 Introduction to application layer protocols. <p>3.4 Application Layer</p> <ul style="list-style-type: none"> 3.4.1 Introduction to application layer protocols, <p>3.5 Network Management commands</p> <p>Unit : 4 : Network Security</p> <ul style="list-style-type: none"> 4.1 Various Types of security, 4.2 Security with certificates, 4.3 Planning a security approach, 4.4 Security problems and their consequences, 4.5 Introduction to firewalls, 4.6 Encryption and decryption standards, 4.7 Secure Socket Layer, 4.8 Virtual Private Networks
Reference Book	<ol style="list-style-type: none"> 1. Data Communications and Networking, 4/e Behrouz A. Forouzan - DeAnza College 2. Computer Networks by A.S. Tanenbaum - PHI Publications 3. Computer Networks : A pragmatic Approach, C R Sharma, Jaico, 2005 4. Data and computer Communication, William stallings - Pearson Education, 5. MCSE: Networking Essentials Study Guide - TMH 6. Mastering Local Area Networks by Christa Anderson & Mark Minasi – BPB
Teaching Methodology	Class Room Teaching, Discussion and Assignment

P.Y.P.C.A



Re-Accredited 'B++' 2.86 CGPA by NAAC

VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

Tel : +91 - 261 - 2227141 to 2227146, Toll Free : 1800 2333 011, Digital Helpline No. - 0261 2388888

E-mail : info@vnsgu.ac.in, Website : www.vnsgu.ac.in

-: પરિપત્ર :-

યુનિવર્સિટી ડિપાર્ટમેન્ટનાં વડાશ્રીઓ અને યુનિવર્સિટી કેમ્પસમાં ચાલતા સ્વનિર્ભર અભ્યાસક્રમનાં કો-ઓર્ડિનેટરશ્રીઓ તથા યુનિવર્સિટી સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓને જાણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૪-૨૫ થી સ્નાતક કક્ષાના તમામ અભ્યાસક્રમો (જે વિદ્યાશાખામાં એપેક્ષ બોરીના નિયમો લાગુ પડતા હોય તે સિવાય) માટે અમલમાં આવનાર Bharatiya Knowledge System (BKS) નો હિન્દુ સ્ટડીઝ અભ્યાસ સમિતિની તા. ૨૭/૦૫/૨૦૨૪ની સભાનાં ઠરાવ ક્રમાંક: ૧ થી VAC હેઠળ મંજૂર કરેલ "ભારતીય જ્ઞાન પરંપરા પ્રવિષ્ટિ" સેમે-૩ નાં અભ્યાસક્રમ મંજૂર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા. ૧૫/૦૬/૨૦૨૪ની સભાનાં ઠરાવ ક્રમાંક: ૮૭

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૪-૨૫ થી સ્નાતક કક્ષાના તમામ અભ્યાસક્રમો (જે વિદ્યાશાખામાં એપેક્ષ બોરીના નિયમો લાગુ પડતા હોય તે સિવાય) માટે અમલમાં આવનાર Bharatiya Knowledge System (BKS) નો હિન્દુ સ્ટડીઝ અભ્યાસ સમિતિની તા. ૨૭/૦૫/૨૦૨૪ની સભાનાં ઠરાવ ક્રમાંક: ૧ થી VAC હેઠળ મંજૂર કરેલ "ભારતીય જ્ઞાન પરંપરા પ્રવિષ્ટિ" સેમે-૩ નાં અભ્યાસક્રમ મંજૂર કરવામાં આવે છે. તથા સેમે-૩ માં ફરજીયાતપણે સદર અભ્યાસક્રમનો અમલ કરવાનો રહેશે, અન્ય વિકલ્પ આપી શકાશે નહીં.

(બિડાશ : ઉપર મુજબ)

ક્રમાંક : એસ./પરિપત્ર/૧૨૭૮૮/૨૦૨૪

તા. ૧૬-૦૬-૨૦૨૪

Wifere
કુલસચિવ એ

પ્રતિ,

- ૧) યુનિવર્સિટી સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ,
- ૨) યુનિવર્સિટી ડિપાર્ટમેન્ટના વડાશ્રીઓ અને યુનિવર્સિટી કેમ્પસમાં ચાલતા સ્વનિર્ભર અભ્યાસક્રમનાં કો-ઓર્ડિનેટરશ્રીઓ.
- ૩) પરીક્ષા નિયામકશી, પરીક્ષા વિભાગ, વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી, સુરત.
- ૪) કો-ઓર્ડિનેટરશ્રી, IKS Centre - Centre for Hindu Studies, વી. ન. દ. શુ. યુનિ. સુરત.

..... જાણ તથા ઘટનું થવા.

વીર નર્મદ દક્ષિણ ગુજરાત વિશ્વવિદ્યાલય

અભ્યાસક્રમ : 'ભારતીય જ્ઞાન પરંપરા પ્રવિષ્ટિ'

સેમેસ્ટર-૩ વર્ષ: ૨૦૨૪-૨૫

અક્રમિક ડાયાલિન્ગ તા. 15-06 -2024
બાબત 9.7 મિનાનાપરિસર 15

કેડિટ : ૨

કુલ કલાકો : ૩૦

યુનિટ	વિષય
૧	<ul style="list-style-type: none"> ➢ ભારતીય વાંગમય અને અધ્યાદશ વિદ્યાસ્થાન ➢ લોકજીવન અને વાચિક પરંપરાઓમાં ભારતીય જ્ઞાન પરંપરા ➢ ભારતીય જ્ઞાન પરંપરાની વૈશ્વિક આવશ્યકતા ➢ ભારતીય જ્ઞાન પરંપરા હાસનાં કારણો અને પુર્નજાગરણ <ul style="list-style-type: none"> • વિદેશી આકમણોથી ઉકૂવેલ અસ્થિરતા • અંગ્રેજો દ્વારા બિનાયોદોગીકરણ
૨	<ul style="list-style-type: none"> ➢ ભારતીય જ્ઞાન પરંપરામાં સામાજિક વ્યવસ્થાઓ અને કળા <ul style="list-style-type: none"> • વ્યક્તિ, કુટુંબ, લોક, રાજ્ય અને રાષ્ટ્ર, • નૃત્ય, સંગીત, સ્થાપત્ય કળાઓ. ➢ પ્રાચીન ભારતમાં વિજ્ઞાન અને પ્રોથ્યોગીકી <ul style="list-style-type: none"> • કૃષ્ણવિજ્ઞાન, ધ્યાતુશાસ્ત્ર, ખગોળવિજ્ઞાન, વસ્ત્ર ઉદ્યોગ ➢ ભારતીય પરંપરામાં અર્થ વિચાર અને સંચાલન <ul style="list-style-type: none"> • આચાર્ય કૌરિલ્યનું અર્થશાસ્ત્ર

સંદર્ભ ગુંથ:

૧. સુરેશ સોની, ભારતમાં વિજ્ઞાનની ઉજ્જવળ પરંપરા, સાહિત્ય, સાધના ટ્રસ્ટ.
૨. પ્રશાંત પોલ, ભારતીય જ્ઞાનનો ખજાનો, ભારત શોધ સંસ્થાન.
૩. ઓમપ્રકાશ પાંડે, ભારત વૈભવ રાષ્ટ્રીય પુસ્તક ન્યાસ ભારત.
૪. Soni Suresh, India's Glorious Scientific traditional , Prabhat Prakashan, 2020.
૫. Treasure Trove of Indian Knowledge: Discovering India's Rich Intellectual Heritage by Prashant Pole.
૬. રાકેશ સિંહા, ભારતીય જ્ઞાન પરંપરા, ભારતીય વિચારમંચ.