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-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
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ક્રમાંક : એસ/પરિપત્ર/સિલેબસ/૨૪૩૦૩/૨૦૨૩
તા.૨૧/૦૯/૨૦૨૩

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

વિષય :– બી.એસસી. (આઈ. ટી.)/એમ.એસસી.આઈ.ટી. (પાંચ વર્ષીય ઈન્ટીગ્રેટેડ) સેમે.–૧ & ૨ અભ્યાસક્રમ બાબત.

મહાશય,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૩–૨૪ થી અમલમાં આવનાર NEP-2020 અંતર્ગત રાજયની સરકારશ્રીની તા.૨૬/૦૭/૨૦૨૩ ની SOP અનુસાર B.Sc. (IT)/M.Sc.(IT) સેમ.–૧ અને ૨ ના (AEC, MDC, Major, Minor) અભ્યાસક્રમનું માળખું અને અભ્યાસક્રમમાં જરૂરી સુધારા સાથે ઈન્ફોર્મેશન ટેકનોલોજી અભ્યાસ સમિતિનાં ચેરમેનશ્રીએ અભ્યાસ સમિતિ વતી મંજૂર કરી વિદ્યાશાખાને કરેલ ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૧૮/૦૯/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંકઃ ૩૫ થી સ્વીકારી મંજૂર કરેલ છે. જેની આથી જાણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૧૮/૦૯/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંકઃ૩૫

:: આથી ઠરાવવામાં આવે છે કે, શૈક્ષણિક વર્ષ ૨૦૨૩–૨૪ થી અમલમાં આવનાર NEP-2020 અંતર્ગત રાજયની સરકારશ્રીની તા.૨૬/૦૭/૨૦૨૩ ની SOP અનુસાર B.Sc. (IT)/M.Sc.(IT) સેમ.–૧ અને ૨ ના (AEC, MDC. Major. Minor) અભ્યાસક્રમનું માળખું અને અભ્યાસક્રમમાં જરૂરી સુધારા સાથે ઈન્ફોર્મેશન ટેકનોલોજી અભ્યાસ સમિતિનાં ચેરમેનશ્રીએ અભ્યાસ સમિતિ વતી મંજૂર કરી વિદ્યાશાખાને કરેલ ભલામણ કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ સ્વીકારી મંજૂર કરવામાં આવે છે.

બિડાણઃ ઉપર મુજબ

કુલસચિવ વતી

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.

Veer Narmad South Gujarat University, Surat

Program Structure: F. Y. B. Sc. (I. T.) / M. Sc. (I .T.) (SEM – 1 and SEM – 2)

(w.e.f. Academic Year June, 2023-2024)

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 – 1

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
				Th. + Pra.	Theory	Practical/ Fieldwork /Project/ Internship					
101	Communication Skills in English	Ability Enhancement Course	100-199 Foundation/ Introductory	2	2	0	Theory/ Written	2 Hrs	25	25	50
102	Mathematics - 1	Multi-Disciplinary Course	100-199 Foundation/ Introductory	4	4	0	Theory/ Written	2 Hrs & 30 Min	50	50	100
103	Fundamentals of Computer	Minor Course	100-199 Foundation/ Introductory	4	4	0	Theory/ Written	2 Hrs & 30 Min	50	50	100
104	Fundamentals of Programming using C -1	Major Course	100-199 Foundation/ Introductory	4	4	0	Theory/ Written	2 Hrs & 30 Min	50	50	100
105	Practical – 1	Major Course	100-199 Foundation/ Introductory	4	0	8	Practical	2 Hrs	50	50	100
106	Skill Enhancement Course – I	Skill Enhancement Course	---------	2	2	0	As per need of the course	2 Hrs	25	25	50*
107	Value Added Course – I	Value Added Course	---------	2	2	0	As per need of the course	2 Hrs	25	25	50*
Total				**22**	**18**	**8**					**550**

Veer Narmad South Gujarat University, Surat

Program Structure: F. Y. B. Sc. (I. T.) / M. Sc. (I .T.) (SEM – 1 and SEM – 2)

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

SEMESTER – 2

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
				Th. + Pra.	Theory	Practical/ Fieldwork /Project/ Internship					
201	Business Communication Skills in English	Ability Enhancement Course	100-199 Foundation/ Introductory	2	2	0	Theory/ Written	2 Hrs	25	25	50
202	Mathematics – 2	Multi- Disciplinary Course	200-299 Intermediate Level Course	4	4	0	Theory/ Written	2 Hrs & 30 Min	50	50	100
203	Fundamentals of Programming using C -2	Major Course	200-299 Intermediate Level Course	4	4	0	Theory/ Written	2 Hrs & 30 Min	50	50	100
204	Introduction to DBMS	Minor Course	100-199 Foundation/ Introductory	4	4	0	Theory/ Written	2 Hrs & 30 Min	50	50	100
205	Practical - 2	Major Course	200-299 Intermediate Level Course	4	0	8	Practical	2 Hrs	50	50	100
206	Skill Enhancement Course – II	Skill Enhancement Course	---	2	2	0	As per need of the course	2 Hrs	25	25	50*
207	Value Added Course – II	Value Added Course	---	2	2	0	As per need of the course	2 Hrs	25	25	50*
Total				**22**	**18**	**8**					**550**
208	Summer Internship	Applicable only to student seeking exit after first year	---	4	----	-------	---	---	--	---	--

P. Y. Desai

Veer Narmad South Gujarat University, Surat

Program Structure: F. Y. B. Sc. (I. T.) / M. Sc. (I .T.) (SEM – 1 and SEM – 2)

(w.e.f. Academic Year June, 2023-2024)

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

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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.
- The journal should be certified by the concerned faculty and by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.

Summer Internship: A student who wishes to exit after successfully completion of first year (Semester-1 and Semester-2) 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. It will be mandatory for the student to opt minimum one 2-credit Skill enhancement course out of offered courses recognized by University during semester-1 to semester-3.

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. It will be mandatory for the student to opt minimum one 2-credit Value Added Course out of offered courses recognized by the University during semester-1 to semester-4.

* There will be only internal evaluation for all SEC and VAC courses and the marks will not be counted for calculation of SGPA or CGPA. However, internal marks will be reflected in student's marksheet.

Veer Narmad South Gujarat University, Surat

Program Structure: F. Y. B. Sc. (I. T.) / M. Sc. (I .T.) (SEM – 1 and SEM – 2)

(w.e.f. Academic Year June, 2023-2024)

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	**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. **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. **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. **PO4 : Advanced Tools Usage** The program teaches the students to apply the advanced tools to solve real world problems. **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. **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. **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.
Program Specific Outcomes	**PSO1**: Students will learn to develop and strengthen the fundamental concepts that are required to solve complex programming problems. **PSO2**: Students will develop the ability to identify, formulate and design solutions to face computational challenges. **PSO3**: Students will be able to apply software engineering concepts to solve real world problems. **PSO4**: Students will be able to learn emerging technologies and apply them for the development of Web applications, Mobile application, Desktop application, etc. **PSO5**: Students will develop necessary Entrepreneur and Technical skills to start their own business in I.T domain.
Mapping between POs and PSOs	

	PSO1	PSO2	PSO3	PSO4	PSO5
PO1					
PO2					
PO3					
PO4					
PO5					
PO6					
PO7					

Medium of Instruction	English
Program Passing Rules	**As per University rules**

Veer Narmad South Gujarat University

Department of ICT

B.Sc.IT, Semester -1

Credits : 02

Paper No: 101

Communication Skills in English (AEC)

Objectives:

1. To enhance language proficiency by providing adequate exposure to communication skills.
2. To orient the students towards functional aspects of language.
3. To enable students to convert the conceptual understanding of communication into everyday practice.
4. To enhance learners communication skills in both social and Professional Context.

Outcomes:

After the completion of the course:

1. Students will able to use language in Functional context.
2. Students' proficiency in 4 language skills will be developed.
3. Students will be well versed at using language in professional setting.

Unit 1.The Fundamentals of Communication:(Theory)

1. Communication: An Overview
2. Need and Importance for effective communication
3. The Seven Cs of Effective Communication
5. Types of Communication
6. Role of creative and critical thinking in Effective Communication
7. Role of Emotions in Communication
8. Role of Interpersonal communication
9. Communication across Culture
10. Barriers to Effective Communication
11. Non-verbal Communication and Body Language

Unit 2.Listening Skills (Theory)

1. Distinguishing between Hearing and Listening

3. Process of Listening
4. Types of Listening
5. Advantages of Listening

Unit 3. Speaking Skills (Theory)

1. Characteristics of an Effective Communicator
3. Important Public speaking skills for Workplace success
4. Principles of good conversationalist

Unit 4: Reading Skills (Theory)

1.Developing Efficient Reading skills & its benefits
2. Interpreting Job Advertisements
3. Interpreting graphics and Data
4. Comprehending News

Unit 5. Writing Skills

1. Importance of Writing
2. Formal and Informal Writing
4. Paragraph writing
5. E-Mail writing
6. Interpreting Brochures and advertisements

Reference Books:

1. Basic Communication Skills For Technology, 2nd Edition,Pearson,Andrea J. Rutherfoord
2. English for Successful Communication,Oxford University Press,RajeevanKaral, Aruna Koneru, Sabina Pillai & Philip Sunil Solomon
3. Communication Skills:For University of Mumbai,Oxford University Press,Meenakshi Raman & Sangeeta Sharma
4. Communication Skills,Oxford University Press, Sanjay Kumar &PushpLata
5. Basics of Communication in English,Macmillan Publishers, Francis Soundaraj.
6. The quick and Easy way to Effective Communication, Mahavir Book House, Dale Carnegie.2018.
7. Communicating for Results4th Edition,Oxford,Carolyn Meyer and N.Bringi Dev, Oxford University Press, 2021.
8. Communicative English Resource book, Renu Anand and Neena Kaul, Oxford University Press, 2018.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR M.Sc. (I.T.) (UG)
SEMESTER-1
Course : 102 : Mathematics-1
Effective from June- 2021
(4 Hours/Week, Credits : 4)

Minimum weeks per semester: 15 (Including class work, examination, preparation, holidays etc)

Purpose of course : Students will be able to explain and apply the basic methods of mathematics.

Course objective : To develop logical sequence in the design and analysis of algorithm, computability theory, software engineering and computer systems.

Pre-requisite : Basics of Mathematics

Course Outcome : Students will be equipped with logic to develop design and analysis of algorithm, computability theory, software engineering and computer systems.

Teaching Methodology : Lectures, Discussion, Independent Study, Seminars and Assignments.

Evaluation Method : 30% Internal assessment and 70% External assessment.

Course Content :

Unit 1 : Relations, functions, sequence and series:
- 1.1 Cartesian Product of Sets
- 1.2 Relations as Sets of ordered Pairs
- 1.3 Types of relations
- 1.3.1 Symmetric Relation
- 1.3.2 Anti-symmetric Relation
- 1.3.3 Reflexive Relation
- 1.3.4 Irreflexive Relation
- 1.3.5 Transitive Relation
- 1.4 Properties of relations
- 1.5 Congruence relations
- 1.6 Equivalent classes
- 1.7 Composition of relations
- 1.8 Algebra of relations
- 1.9 Functions as sets of ordered pairs
- 1.10 One–One function, Onto function, Many–One function.
- 1:11 Countable sets
- 1.12 Equality of functions
- 1.13 Algebra of functions
- 1.14 Compositions of two functions
- 1.15 Inverse functions, Characteristics functions
- 1.16 Convergent and Divergent Sequence and Series

Unit 2 : Theory of Matrices:
- 2.1 Matrices
- 2.2 Types of matrices

2.3 Equality of matrices
2.4 Operations on matrices
2.5 Properties of Operations, Singular Matrices
2.6 Inverse of Matrices, Adjoint of Matrix
2.7 Rank of Matrices
2.8 Elementary Row / Column transformations
2.9 Row/Column equivalent canonical forms
2.10 Inverse using elementary transformations
2.11 Solution of a system of Homogeneous and Non –Homogeneous linear equations by using elementary transformations.

Unit 3 : Basic Statistics:
3.1 Introductions: Definitions, Merits and Demerits
3.2 Frequency distribution and frequency charts
3.3 Measures of Central Tendency
3.3.1 Arithmetic mean
3.3.2 Geometric mean
3.3.3 Harmonic mean
3.4 Median
3.5 Mode
3.6 Quartiles, Deciles and Percentiles
3.7 Measures of Dispersion
3.7.1 Range
3.7.2 Quartile deviation
3.7.3 Mean deviation
3.7.4 Standard deviation
3.7.5 Skewness and Kurtosis

Unit 4 : Probability Theory
4.1 Definitions
4.2 Sample spaces
4.3 Events
4.3.1 Types of events
4.3.2 Algebra of events
4.4 Conditional Probability
4.6 Baye's theorem

Unit 5 : Random variables and distributions:
5.1 Discrete and Continuous Random variables
5.2 Mathematical expectations and Variance
5.3 Discrete Probability Distributions
5.3.1 Binomial Distribution
5.3.1.1 Density function
5.3.1.2 Mean and Variance of the Distributions Properties and uses
5.3.2 Poisson Distribution
5.3.2.1 Density function
5.3.2.2 Mean and Variance of the distribution
5.3.2.3 Properties and uses

Reference Books :

1. C.L. Liu, D.P. Mohapatra : Elements of Discrete Mathematics, McGraw Hill, 2008.
2. B.S. Vatsa : Discrete Mathematics, Vishwa Prakashan, 3rd Edition, 2000.
3. Suddhendu Biswas : A text Book of Matrix Algebra, New age International Publishers, New Delhi, 3rd Edition, 2004.
4. Robert A. Beezer : A first Course in Linear Algebra, University of Puget Sound, 3rd edition
5. J.J. Gareth, Mark Lemmon : Mathematics for Computer Scientists, bookboon.cpm, 2nd Edition, ISBN: 978-87-7681-426-7
6 .J.P. Tremblay and R. Manohar : Discrete mathematical Structures with Applications to Computer Science, McGraw Hill Book Co., 1999.

B.Sc. (I.T.) / M.Sc. (I.T.) 1st Semester

Course : 103 : Fundamentals of Computer

<table>
<tr><td>Course Code</td><td>103</td></tr>
<tr><td>Course Title</td><td>Fundamentals of Computer</td></tr>
<tr><td>Credit</td><td>4</td></tr>
<tr><td>Teaching per Week</td><td>4 Hrs</td></tr>
<tr><td>Minimum weeks per Semester</td><td>15 (Including Class work, examination, preparation, holidays etc.)</td></tr>
<tr><td>Last Review / Revision</td><td>June 2023</td></tr>
<tr><td>Purpose of Course</td><td>This course helps students to understand basics of computer and office tools</td></tr>
<tr><td>Course Objective</td><td>The students would be able to understand the basic uses and applications of computer, to know different components of computer, to get familiar with various computer codes, basics of operating system and commands. The student would also learn open-source office tools.</td></tr>
<tr><td>Course Out comes</td><td>CO1 : Student will be able to learn about computer hardware components and its working

CO2 : Students will be able to work with different types of number systems ,and able to perform numerical of Binary, Octal and Hexadecimal numbers

CO3 : Student will be able to learn various type of operating system, working of Linux operating system and work on features of OpenOffice open source software</td></tr>
<tr><td>Mapping between COs with PSOs</td><td><table><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></td></tr>
<tr><td>Pre-requisite</td><td>NIL</td></tr>
<tr><td>Course Outcome</td><td>Students will be able to understand better use of computer and its operations</td></tr>
<tr><td>Course Content</td><td>Unit : 1 : Introduction to Computers and its components
1.1 Computer
1.1.1 Introduction to Computer
1.1.2 The Components of Computer
1.1.3 Advantages and Disadvantages of Computer
1.1.4 Generations of Computer
1.1.5 Computer Software
1.1.6 Categories of Computers
1.1.6.1 Personal Computers
1.1.6.2 Mobile Computers
1.1.6.3 Servers
1.1.6.4 Mainframes
1.1.6.5 Super Computers
1.1.6.6 ATM
1.1.6.7 POS
1.1.7 Usage and Applications of Computer in Society</td></tr>
</table>

1.2 Components of Computer

1.2.1 Block Diagram of Computer

1.2.2 The System Unit

1.2.3 Processor

1.2.4 Motherboard

1.2.5 Memory - Register, RAM, ROM

1.2.6 Expansion Slots and Adaptor Cards

1.2.7 Ports and Connectors

1.2.8 Buses

1.2.9 Power Supply

1.2.10 Input Output Systems

1.2.11 Storage Systems

1.2.12 BIOS

1.2.13 Interrupt

1.2.14 Device Driver

Unit : 2 : Computer Codes and Conversions

2.1 Computer Codes

2.1.1 Introduction to Computer Codes

2.1.2 Decimal System

2.1.3 Binary System

2.1.4 Hexadecimal System

2.1.5 Octal System

2.1.6 4-bit BCD System

2.1.7 8-bit BCD System

2.1.8 ASCII code

2.1.9 16-bit Unicode

2.2 Conversion of Numbers (from one Number System to another - includes fixed and fractional numbers)

Unit : 3 : Operating System and Usage

3.1 Types of OS

3.1.1 Single User

3.1.2 Multi - User

3.1.3 Uni - Processor

3.1.4 Multi - Processor

3.1.5 Batch Processing

3.1.6 Time - Sharing

3.1.7 Real Time

3.2 Booting Process of Computer

3.7 Need of OS

3.6 Functions of OS

3.3 Types of File System - FAT, NTFS, APFS, EXT

3.4 Partition of Disk

3.5 Installation of OS

	Unit : 4 : Introduction to Open Source OS : Linux 4.1 Features and Components of Linux 4.2 Components of Linux 4.3 Installation and Configuration of Open Source Software 4.3 Basic Commands – cat, cmp, diff, wc, sort, mkdir, rmdir, cd, ls, cp, mv, pwd, passwd, who, whoami, chmod, date, more, sudo, apt-get, install, update, upgrade. **Unit : 5 : Open Office** 5.1 Open Office – Writer 5.1.1 Working with Documents 5.1.2 Formatting Documents 5.1.3 Setting Page style 5.1.4 Creating Tables 5.1.5 Drawing- Tools 5.1.6 Printing Documents 5.2 Open Office – Calc 5.2.1 Introduction to Spreadsheets 5.2.2 Overview of a Worksheet 5.2.3 Creating Worksheet & Workbooks 5.2.4 Organizing files, Managing files & workbooks 5.2.5 Functions & Formulas 5.2.6 Working with Multiple sheets 5.2.7 Creating Charts & Printing Charts 5.3 Open Office – Impress 5.3.1 Creating Presentation, Saving Presentation Files 5.3.2 Master Templates & Re-usability 5.3.3 Slide Transition 5.3.4 Making Presentation CDs 5.3.5 Printing Handouts
Reference Book	1. Fundamentals of Computer : E Balagurusamy - McGraw-Hill 2. Computer Fundamentals : P.K. Sinha - BPB Publications 3. OpenOffice.org for Dummies : Gurdy Leete - Wiley-India 4. Computer Fundamentals : Anita Goel - Pearson 5. Fundamentals of Computer : Rajaraman V. - PHI 6. Fundamentals of Computers : Reema Thareja - Oxford University Press
Teaching Methodology	Class Room Teaching, Discussion and Assignment

P. M Desai

B.Sc. (I.T.) / M.Sc. (I.T.) 1st Semester

Course : 104 : Fundamentals of Programming Using C – I

<table>
<tr><td>Course Code</td><td>104</td></tr>
<tr><td>Course Title</td><td>Fundamental of Programming using C-I</td></tr>
<tr><td>Credit</td><td>4</td></tr>
<tr><td>Teaching per Week</td><td>4 Hrs</td></tr>
<tr><td>Minimum weeks per Semester</td><td>15 (Including Class work, examination, preparation, holidays etc.)</td></tr>
<tr><td>Last Review / Revision</td><td>June 2023</td></tr>
<tr><td>Purpose of Course</td><td>To provide fundamental knowledge of programming using C language.</td></tr>
<tr><td>Course Objective</td><td>To impart knowledge of basic programming concepts using C language.</td></tr>
<tr><td>Course Out comes</td><td>CO1: Students will be able to learn various Problem-solving techniques

CO2 : Students will be able to learn basics of c programming language and perform practical programs

CO3 : students will be able to do string manipulation and array task</td></tr>
<tr><td>Mapping between COs with PSOs</td><td><table><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></td></tr>
<tr><td>Pre-requisite</td><td>NIL</td></tr>
<tr><td>Course Outcome</td><td>Students will be able to write simple programs using C language</td></tr>
<tr><td>Course Content</td><td>Unit : 1 : Phases of Problem Solving Methodology
1.1 Problem Analysis
Gathering available data, identifying relevant facts, Defining the problem, generating alternative methods of solution, Selecting the optimum approach
1.2 Problem solving techniques
Simplification, Divide and conquer: break down a large, complex problem into smaller solvable problems, Constraint examination
1.3 Algorithm
1.4 Flowchart

Unit : 2 : Introduction to Computer Programming
2.1 Introduction to Computer Programming Language and Program
2.2 Programming languages and Levels
2.3 Language Translators
2.3.1 Compiler
2.3.2 Interpreter
2.3.3 Assembler
2.4 Program Verification
2.4.1 Program Correctness
2.4.2 Program Bugs & Testing

Unit : 3 : Introduction to C language
3.1 Overview of C
3.2 Constants, Variables and Data types
3.3 Operators and expressions
3.4 Simple Assignment statement
3.5 Basic Input/Output Statements</td></tr>
</table>

P. M Desai

	3.6 Decision Making Statements 3.7 Looping 3.8 Nested Control Structures **Unit : 4 : Array** 4.1 One dimensional Array 4.2 Declaration & Initialization of Array 4.3 Two dimensional array 4.3.1 Declaration 4.3.2 Accessing Matrix Elements 4.3.3 Operations on matrix elements and entire matrices 4.4 Array manipulation 4.4.1 Searching 4.4.2 Insertion 4.4.3 Deletion 4.4.4 Modification 4.4.5 Sorting 4. 5 Multidimensional Array **Unit : 5 : Character Array & String** 5.1 Declaration & Initialization of String 5.2 Input/Output functions for String 5.3 Arithmetic operations on String 5.4 In built Functions for handling String 5.5 Array of String
Reference Book	1. Programming in ANSI C : E. Balagurusamy - Tata McGraw Hill 2. Let us C : Yashwant Kanetkar - BPB Publications 3. Programming with C : R S Bichkar - Universities Press 4. The complete Reference C : Herbert Schildt - McGrawHill 5. Schaums outline of Theory and Problems of programming with C : Byron Gottfried - McGrawHill 6. C Programming Language : Karnighan & Ritchie - TMH
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment

P. Y Desai

B.Sc. (I.T.) / M.Sc. (I.T.) 1st Semester

Course : 105 : Practical 1

Course Code	105
Course Title	Practical 1
Credit	4
Teaching Per Week	8 Hrs
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Last Review/Revision	June 2023
Purpose of Course	To impart practical knowledge of programming
Course Objective	To give practical knowledge of C programming
Prerequisite	Nil
Course Out comes	CO1 : Students will be able to learn basic programming concepts using C language. CO2 : Students will be able to solve and program complex problem using C language. CO3 : Students will be able to use C language features for basic application development.
Mapping between COs with PSOs	
Course Outcome	Students will be able to solve practical problems using C language.
Course Content	Practical based on Paper No. 104 - Fundamentals of Programming using C-I
Reference Books	NIL
Teaching Methodology	Lab Work

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1					
CO2					
CO3					

Veer Narmad South Gujarat University

Department of ICT

B.Sc.IT , Semester 2

Credits: 02

Paper No: 201

Business Communication Skills in English (AEC)

Objectives:

- To produce skilled and industry ready professionals for better placements and preparing them for the real world .
- To make the students aware about business, corporate and IT related professional Communication.
- Make the students proficient &enable them to meet the requirements of communication at the office .

Outcomes:

Students will be ready for the real world.
Students will be aware about the Scenario in Corporate world.
Students will be able to communicate well in IT Organization.

Unit 1. Understanding Business and Professional Communication :(Theory)

- Professional Communication- Meaning and Need
- Features of successful Professional communication
- Purpose of Professional communication
- The Role and Purpose of Business Communication

Unit 2: Understanding Specific Communication Needs (Theory)

- Corporate communication
- Persuasive strategies in Business communication
- Ethics in Business communication
- Business Etiquette and Netiquette

Unit 3: Business Writing

- Business writing

- Business conversations
- Writing for a website

Unit 4: Business Vocabulary :

- Business Idioms
- Expressions :

Resume, Interview, Meetings,Group discussion, Client conversations, Presentations

Unit 5 :LSRW Skills in Business Communication :

- Business Greetings
- Talking about Software, Website, IT Companies, New Trends in IT,
- Business terms with correct Pronunciations
- Tasks based on LSRW Skills:

Reference Books:

1. Business Communication –Connecting in a Digital world, Mc.Graw Hill, Raymond V. Lesikar
2. Business Communication,Oxford University Press,Carolyn Meyer & N. Bringi Dev
3. Intercultural Business Communication,Oxford University Press, Robert Gibson
4. Business Communication: Connecting at Work,Oxford University Press,Hory Sankar Mukerjee
5. Communication Skills for Professionals ,Prentice Hall India Learning Private Limited; 2nd edition (2011),Konar N.
6. The New Rules of Business ,Penguin Random House ,Srivastava , Rajesh,2019.
7. Business Communication,Harvard Business Review Press,
8. Professional Communication,Oxford,Meenakshi Raman,Sangeeta Sharma.2017
9. Business Communication (2nd Edition) Meenakshi Raman,Prakash Singh.2019.
10. Successful Presentations for professionals who use English at work. Oxford University Press, Video Course.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT.
SYLLABUS FOR M.Sc. (I.T.) (UG)
SEMESTER-2
Course : 202 : Mathematics-2
Effective from June- 2021
(4 Hours/Week, Credits : 4) 0.1. Change

Minimum weeks per semester: 15 (Including class work, examination, preparation, holidays etc)

Purpose of course : Students will be able to explain and apply the basic methods of mathematics.

Course objective : To develop logical sequence in the design and analysis of algorithm, computability theory, software engineering and computer systems.

Pre-requisite : Basics of Mathematics

Course Outcome : Students will be equipped with logic to develop design and analysis of algorithm, computability theory, software engineering and computer systems.

Teaching Methodology : Lectures, Discussion, Independent Study, Seminars and Assignments.

Evaluation Method : 30% Internal assessment and 70% External assessment.

Course Content :

Unit 1: Basic concept of Graph Theory :

1.1 What is graph?
1.2 Application of Graphs
1.3 Directed graph
1.4 Finite and Infinite graphs
1.5 Incidence and Degree
1.6 Isolated vertex, Pendent vertex and Null graph
1.7 Simple graph
1.8 Regular graph

Unit 2 : Paths and Circuits :

2.2 Isomorphism
2.2 Sub graphs
2.3 A puzzle with Multicolored cubes
2.4 Walks, Paths and Circuits
2.5 Connected graphs, disconnected graphs and Components, Decomposition
2.6 Euler graphs, Universal graph
2.7 Operations on graphs –Union, Intersection, Ring sum
2.8 Complete graph
2.9 Hamiltonian paths and Circuits
2.10 Seating arrangement problems
2.11 The travelling Salesman problem

Unit 3 : Trees and Fundamental Circuits :

3.1 Trees
3.2 Some properties of trees

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3.3 Pendent Vertices in a tree
3.4 Distance and Centers in a tree
3.5 Rooted and Binary trees
3.6 On counting trees
3.7 Spanning trees
3.7.1 Finding all Spanning trees of graph
3.8 Fundamental circuits
3.9 Spanning tree in a Weighted graph

Unit 4 : Planar graphs :

4.1 Combinatorial vs Geometric graphs
4.2 Planar graphs
4.3 Non–Planar graphs
4.3 Kuratowski's $K_{3,3}$ and K_5 graphs.
4.4 Different representation of planar graph

Unit 5 : Matrix representation of graphs :

5.1 Incidence matrix
5.2 Sub matrices of A(G)
5.4 Path matrix
5.5 Adjacency matrix.

Reference Books :

1. Narsinh Deo : Graph Theory with applications to engineering and computer Science, Prentice – Hall Inc. (2005).
2. B. Satyanarayan, K.S. Prasad : Discrete Mathematics & Graph Theory, PHI (2009).
3. R.Manohar, Trembly J.P.: Discrete Mathematical structure with application to Computer Science, TMH, 1999.
4. Wilson R.J.: Introduction to Graph Theory, 3rd edition, Longmann, 1984.
5. Gibbons A.: Algorithmic Graph Theory, Cambridge University Press, 1984.
6. Harry F.: Graph Theory, Narosa Publication, 1995.
7. Richard J.: Discrete Mathematics, Pearson Educations, Asia, 2001.

B.Sc. (I.T.) / M.Sc. (I.T.) 2nd Semester

Course : 203 : Fundamentals of Programming using C - II

<table>
<tr><td>Course Code</td><td>203</td></tr>
<tr><td>Course Title</td><td>Fundamentals of Programming using C - II</td></tr>
<tr><td>Credit</td><td>4</td></tr>
<tr><td>Teaching per Week</td><td>4 Hrs</td></tr>
<tr><td>Minimum weeks per Semester</td><td>15 (Including Class work, examination, preparation, holidays etc.)</td></tr>
<tr><td>Last Review / Revision</td><td>June 2023</td></tr>
<tr><td>Purpose of Course</td><td>To teach advanced concepts of C language</td></tr>
<tr><td>Course Objective</td><td>To impart knowledge of structures, union, pointers, user defined functions, pre-processor directives and file management features of C language.</td></tr>
<tr><td>Course Outcomes</td><td>CO1 : Students will be able to learn advanced concepts of c programming like pointer , structure, union, etc.

CO2 : Students will be able to have the knowledge of file system and file management concepts with c language

CO3 : Students will be have ability to work on pre-processor</td></tr>
<tr><td>Mapping between COs with PSOs</td><td><table><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></td></tr>
<tr><td>Pre-requisite</td><td>Basic knowledge of problem solving and C programming.</td></tr>
<tr><td>Course Outcome</td><td>Students will be able to write programs using structures, union, pointers, user defined functions, pre-processor directives and file management in C language.</td></tr>
<tr><td>Course Content</td><td>Unit : 1 : Structure and Union
1.1 Structure
1.1.1 Declaring and Defining Structure elements
1.1.2 Structure Initialization
1.1.3 Structure assignment
1.1.4 Array of Structure, Array within a structure
1.1.5 Nested Structure
1.1.6 Size of Structure
1.2 Union

Unit : 2 : User Defined Functions
2.1 Introduction
2.2 Declaration and Definition
2.3 Methods of parameter passing
2.4 Scope of variables and storage classes
2.5 Recursion
2.6 Passing array to functions
2.7 Passing Structure, union to function

Unit : 3 : Pointer
3.1 Pointer Basics
3.2 Pointers and arrays
3.3 Chain of pointers</td></tr>
</table>

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	3.4 Pointer and character strings 3.5 Array of pointers, pointer to array 3.6 Pointer and functions 3.6.1 Call by value & call by reference 3.6.2 Passing array to a function using pointer 3.7 Pointer to structures 3.8 Issues with pointers 3.9 Dynamic memory allocation 3.9.1 Allocating a memory block 3.9.2 Allocating multiple blocks of memory 3.9.3 Altering the size of a block 3.9.4 Releasing used Space **Unit : 4 : File Management in C** 4.1 Introduction: Definition, File structure, concept of Record 4.2 File access modes: Sequential, random, binary, 4.3 File Operations 4.2.1 Creating a new file 4.2.2 Opening a file 4.2.3 Reading from a file 4.2.4 Writing to a file 4.2.5 Moving to a specific location in a file (Seek) 4.2.6 Closing a file 4.4 Error handling during I/O operations 4.5 Command Line Arguments **Unit : 5 : The Pre-processor** 5.1 Features of C Preprocessor 5.2 Macro 5.3.1 Macro Expansion 5.3.2 Macro with arguments 5.3.3 Nested Macro 5.3 File Inclusion 5.4 Conditional compilation 5.5 Compiler Control Directives
Reference Book	1 Programming in ANSI C : E. Balagurusamy - Tata McGraw Hill 2 Let us C : Yashwant Kanetkar - BPB Publications 3 Pointers in C : Yashwant Kanetkar - BPB 4 The complete Reference C : Herbert Schildt - McGrawHill 5 Programming with C : R S Bichkar - Universities Press 6 C Programming Language : Karnighan & Ritchie - TMH 7 Mastering Turbo C : Stan Kelly - BPB
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment

P. M. Desai

B.Sc. (I.T.) / M.Sc. (I.T.) 2nd Semester

Course : 204 : Introduction to DBMS

<table>
<tr><td>Course Code</td><td>204</td></tr>
<tr><td>Course Title</td><td>Introduction to DBMS</td></tr>
<tr><td>Credit</td><td>4</td></tr>
<tr><td>Teaching per Week</td><td>4 Hrs</td></tr>
<tr><td>Minimum weeks per Semester</td><td>15 (Including Class work, examination, preparation, holidays etc.)</td></tr>
<tr><td>Last Review / Revision</td><td>June 2023</td></tr>
<tr><td>Purpose of Course</td><td>To introduce the basic concepts of database management system that includes data models, database design and basic practical of open-source DBMS.</td></tr>
<tr><td>Course Objective</td><td>To teach fundamental concepts of DBMS including data models, ER diagrams, different types of databases. This course also entails practical aspects of open-source database.</td></tr>
<tr><td>Course Out comes</td><td>CO1 : Student will be able to learn basic concept of database management system and data models

CO2 : Students will be have the knowledge of various data models

CO3 : Student will be able work on database management system MySQL and perform practical like creating database , tables and manipulating records</td></tr>
<tr><td>Mapping between COs with PSOs</td><td><table><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></td></tr>
<tr><td>Pre-requisite</td><td>Fundamentals of Computer, Programming Language</td></tr>
<tr><td>Course Outcome</td><td>Students will be able to understand and implement basic database design principles, learn overview of different types of databases. Students will also be able to perform practical on database.</td></tr>
<tr><td>Course Content</td><td>Unit : 1 : Basic Concepts of DBMS
1.1 File Organization and Traditional File based System
1.2 Database and Need for DBMS
1.3 Characteristics of DBMS
1.4 Applications of DBMS
1.5 Views of Data - Schema and instances
1.6 Data Independence
1.7 Database Languages
1.8 Transaction Management
1.9 ACID Properties of Transaction
1.10 Database Administrator and Database Users
1.11 Overall System Architecture</td></tr>
</table>

Unit : 2 : Data Models

2.1 Data Models
- 2.1.1 Network Model
- 2.1.2 Hierarchical Model
- 2.1.3 Relational Model
- 2.1.4 Object Model
- 2.1.5 Object-Relational Model

2.2 Entity Relationship Model
- 2.2.1 DB Design using ER Model
- 2.2.2 Entities
- 2.2.3 Relationships
- 2.2.4 Attributes
- 2.2.5 Entities and Relationship Set
- 2.2.6 Constraints and Design Issues
- 2.2.7 Weak Entity Set
- 2.2.8 Cardinality Ratio

Unit : 3 : Types of Databases and Recent Trends in DBMS

3.1 Types of Databases
- 3.1.1 Object Oriented Database
- 3.1.2 Centralized Database
- 3.1.3 Distributed Database
- 3.1.4 Parallel Database
- 3.1.5 Multimedia Database
- 3.1.6 NoSQL Database
- 3.1.7 Temporal Database
- 3.1.8 XML Database

3.2 Recent Trends in DBMS

3.2.1 Overview of Various Databases - MySQL, PostgreSQL, SQLite, MongoDB, MariaDB, Oracle, DB2and SQL Server

3.3 Big Data

Unit: 4 : Introduction to Open Source Database - MySQL

4.1 Getting Started with MySQL

4.2 Installing MySQL

4.3 Data Types

4.4 Creating and Using Database

4.5 DDL Statements
- 4.5.1 Create Table
  - 4.5.1.1 Constraints
  - 4.5.1.2 Primary Key and Foreign Key Constraint
- 4.5.2 Alter Table
- 4.5.3 Delete Table

Unit : 5 : DML Statements and Other Functions of MySQL

5.1 DML Statements
- 5.1.1 Insert Statement
- 5.1.2 SQL
- 5.1.3 Select Statement
- 5.1.4 Update Statement
- 5.1.5 Delete Statement

5.2 Aggregate Functions

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	5.3 Numerical Functions 5.4 String and Character Functions
Reference Book	1. Database System Concepts : Silberschatz, Korth and Sudarshan - McGraw Hill 2. An introduction to database systems : C. J. Date - Addison Welsley 3. Fundamentals of Database Systems : Elamsri, Navathe, Somayajulu and Gupta - Pearson Education 4. PHP and MySQL Web Development (Developer's Library) : Luke Welling - Addison - Wesley Professional 5. The Compete Reference MySQL : Vikram Vaswani - McGraw Hill 6. Murach's MySQL : Joel Murach - Mike Murach & Associates, Inc.
Teaching Methodology	Lectures, Discussion, Independent Study, Seminars, Case Study and Assignment

P. M Desai

B.Sc. (I.T.) / M.Sc. (I.T.) 2nd Semester

Course : 205 : Practical 2

<table>
<tr><td>Course Code</td><td>205</td></tr>
<tr><td>Course Title</td><td>Practical 2</td></tr>
<tr><td>Credit</td><td>4</td></tr>
<tr><td>Teaching Per Week</td><td>8 Hrs</td></tr>
<tr><td>Minimum Weeks Per Semester</td><td>15 (Including Practical Work, Examination, Preparation, Holidays etc.)</td></tr>
<tr><td>Last Review/Revision</td><td>June 2023</td></tr>
<tr><td>Purpose of Course</td><td>To impart practical knowledge of structures, union, pointers, user defined functions, preprocessor directives, file management, etc. features of programming & basic database management concepts.</td></tr>
<tr><td>Course Objective</td><td>To give practical knowledge of structures, union, pointers, user defined functions, preprocessor directives, file management, etc. using C language. & database creation, management, basic database queries using MySQL.</td></tr>
<tr><td>Prerequisite</td><td>Basic knowledge of C language and Programming Concepts</td></tr>
<tr><td>Course Out comes</td><td>CO1 : Students will be able to solve problems using advanced features of C language.

CO2 : Students will be able to solve complex problems using pointers in C language.

CO3 : Students will be able to do database management operations using MySQL</td></tr>
<tr><td>Mapping between COs with PSOs</td><td><table><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></td></tr>
<tr><td>Course Outcome</td><td>Students will be able to solve problems using advanced features of C language & design MySQL database(s) along with data manipulation concepts of DBMS.</td></tr>
<tr><td>Course Content</td><td>Practical based on Paper No. 203 - Fundamentals of Programming using C-II & Paper No. 204 – Introduction to DBMS.
Weightage: 70% based on Paper No 203
30% based on Paper No 204</td></tr>
<tr><td>Reference Books</td><td>NIL</td></tr>
<tr><td>Teaching Methodology</td><td>Lab Work</td></tr>
</table>

P. M Desai