

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY



CIRCULAR NO.SU/B.Sc./31/2022

It is hereby inform to all concerned that, the syllabi prepared by the Ad-hoc Board and recommended by the Dean, Faculty of Science & Technology, the Hon'ble Vice-Chancellor has accepted the **following revised syllabi of Bachelor of Science Degrees with Regulation under the scheme of Choice Based Credit & Grading System** in his emergency powers under section 12(7) of the Maharashtra Public Universities Act, 2016 on behalf of the Academic Council as appended herewith. Earlier published syllabus vide circular dtd. 19.09.2022 is stand cancelled.

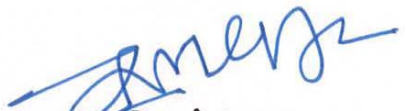
Sr.No.	Courses	Semester
1.	B.Sc. Information Technology (Degree)	Ist semester
2.	B.Sc. Computer Science (Degree)	Ist semester
3.	B.C.A.(Science) (Degree)	Ist semester

This is effective from the Academic Year 2022-23 and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.SU/2022/12788-89
Date:- 19.10.2022.

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Deputy Registrar
Academic (Syllabus)

Copy forwarded with compliments to :-

- 1] **The Principal of all concerned Colleges,**
Dr. Babasaheb Ambedkar Marathwada University,
- 2] **The Director, University Network & Information Centre, UNIC, with a request to upload this Circular on University Website.**

Copy to :-

- 1] **The Director, Board of Examinations & Evaluation, Dr.BAMU,A'bad.**
- 2] The Section Officer,[B.Sc.Unit] Examination Branch,Dr.BAMU,A'bad.
- 3] The Programmer [Computer Unit-1] Examinations, Dr.BAMU,A'bad.
- 4] The Programmer [Computer Unit-2] Examinations, Dr.BAMU,A'bad.
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Dr. Babasaheb Ambedkar Marathwada University
Aurangabad- 431004(MS) India



Three Year Undergraduate Bachelor Degree Program
In Science and Technology

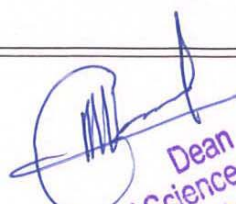
B. Sc. (Information Technology)

Curriculum Structure and Scheme of
Examination

Choice Based Credit System

(Effective from Academic Year 2022-23)

Dr. Babasaheb Ambedkar Marathwada University
Aurangabad – 431004 (MS) India


Dean
Faculty of Science & Technology
Dr. Babasaheb Ambedkar Marathwada
University, Aurangabad



Pattern of Question Paper (Theory)

B.Sc. (Information Technology) Semester -----

Course Code -----

Paper Number -----

Title of Paper -----

Time : 1.30 Hrs.

Max Marks: 40

N.B.

1. Attempt All Questions.

2. All questions carry equal marks.

3. Illustrate your answer with suitable labelled diagram.

Q.1. Multiple choice questions / Fill In the Blanks / Terms / Definition / One Line

Answer questions. (10 Marks)

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

Q.2. Long answer question

(10 Marks)

OR

Short answer questions

a)

b)

Q.3. Long answer question

(10 Marks)

OR

Short answer questions

a)

b)

Q.4. Short Notes on any TWO of the following:-

(10 Marks)

a)

b)

c)

Prat

Dr. Babasaheb Ambedkar
Marathwad+A8+A3:F21+A3:F23+A8+A3:F21+A8+A3:F23
Choice Based Credit System (CBCS) Curriculum

For
Faculty of Science and Technology
Course Structure (First Year)

B. Sc. (Information Technology) Three Year Undergraduate Degree Program

First Year

Course Type	Semester – I		Course Type	Semester - II	
	Name of Paper	Credit		Name of Paper	Credit
Core Course I DSC-1A 5.5	Computer Fundamentals	2	Core Course IV DSC-1B 5.5	Data Structure	2
	Digital Electronics	2		8086 Microprocessor	2
	Lab Course	1.5		Lab Course	1.5
Core Course II DSC-2A 5.5	Operating system-I	2	Core Course V DSC-2B 5.5	Operating system-II	2
	Programming in C	2		Advanced Programming in C	2
	Lab Course	1.5		Lab Course	1.5
Core Course III DSC-3A 5.5	Mathematical Foundation (M1)	2	Core Course VI DSC-3B 5.5	Numerical Method (M2)	2
	Programming Methodology	2		Database Management System	2
	Lab Course	1.5		Lab Course	1.5
Ability Enhancement Compulsory Courses (AECC), 01 Course, 3 credit each)	English Communication Skills (Linguistic Approach)	3	Ability Enhancement Compulsory Courses (AECC), 01 Course 3, credit each)	English Communication Skills (Soft Skill Development)	3
	Marathi/Hindi/Urdu/Arabic	3		Marathi/Hindi/Urdu/Arabic	3
Non-Credit Course	-----	----	Non-Credit Course	Constitution of India	--
Total Credit	22.5			22.5	

B. Sheth

Structure and Curriculum for
Bachelor of Science (B.Sc.) **Information Technology**
(Choice Based Credit System)
Dr. Babasaheb Ambedkar Marathwada University, Aurangabad
Choice Based Credit System (CBCS) Curriculum
For

Faculty of Science and Technology
Course Structure and Scheme of Examination

B. Sc. (Information Technology) Science Three Year Under Graduate Degree Program

Semester-I

Course Type	Course Code	Course Title	Total Periods (Teaching Periods / Week)	Credits	Scheme of Examination			
					UA	IA	Max Marks	Min Marks
Core Course I (DSC-1A)	IT-111T	Computer Fundamentals	45 (3/per week)	2	40	10	50	20
	IT - 112T	Digital Electronics	45 (3/per week)	2	40	10	50	20
	IT-121P	Lab Course (based on IT -111T and IT-112T)	45 (3/per week)	1.5	40	10	50	20
Core Course II (DSC-2A))	IT-113T	Operating System-I	45 (3/per week)	2	40	10	50	20
	IT114T	Programming in C	45 (3/per week)	2	40	10	50	20
	IT-122P	Lab Course (based on CS-113T and CS-114T)	45 (3/per week)	1.5	40	10	50	20
Core Course III (DSC-3A)	IT-115T	Mathematical Foundation (M1)	45 (3/per week)	2	40	10	50	20
	IT-116T	Programming Methodology	45 (3/per week)	2	40	10	50	20
	IT-123P	Lab Course (based on CS-115T and CS-116T)	45 (3/per week)	1.5	40	10	50	20
Ability Enhancement Compulsory Courses (AECC-I)	IT-131T	English communication Skills(linguistic Approach)	45 (5/per week)	3	40	10	50	20
	IT-132T	Marathi/Hindi/Urdu/Arabic SL-I	45 (4/per week)	3	40	10	50	20
Non Credit Course								
36 Period Per week				22.5	440	110	550	220

*DCS - discipline Specific core courses Total Credit for Semester I : 22.5 (Theory : 18 : Laboratory : 4.5)

Structure and Curriculum for
Bachelor of Science (B.Sc.) Information Technology
(Choice Based Credit System)

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Choice Based Credit System (CBCS) Curriculum

Faculty of Science and Technology

Course Structure and Scheme of Examination

B. Sc. (Information Technology) Science Three Year Under Graduate Degree Program

Semester-II

Course Type	Course Code	Course Title	Total Periods (Teaching Periods / Week)	Credits	Scheme of Examination			
					UA	IA	Max Marks	Min Marks
Core Course I (DSC-1A)	IT-211T	Data Structure	45 (3/per week)	2	40	10	50	20
	IT - 212T	8086 Microprocessor	45 (3/per week)	2	40	10	50	20
	IT-221P	Lab Course (based on IT -111T and IT-112T)	45 (3/per week)	1.5	40	10	50	20
Core Course II (DSC-2A))	IT-213T	Operating System-II	45 (3/per week)	2	40	10	50	20
	IT214T	Advance Programming in C	45 (3/per week)	2	40	10	50	20
	IT-222P	Lab Course (based on CS-113T and CS-114T)	45 (3/per week)	1.5	40	10	50	20
Core Course III (DSC-3A)	IT-215T	Numerical Method (M2)	45 (3/per week)	2	40	10	50	20
	IT-216T	Database Management System	45 (3/per week)	2	40	10	50	20
	IT-223P	Lab Course (based on CS-115T and CS-116T)	45 (3/per week)	1.5	40	10	50	20
Ability Enhancement Compulsory Courses (AECC-I)	IT-231T	English communication Skills(linguistic Approach)	45 (5/per week)	3	40	10	50	20
	IT-232T	Marathi/Hindi/Urdu/Arabic SL-I	45 (4/per week)	3	40	10	50	20
Non Credit Course	IT-213T	Constitution of India						
36 Period Per week				22.5	440	110	550	220

*DCS – discipline Specific core courses **Total Credit for Semester I : 22.5 (Theory : 18 : Laboratory : 4.5)**

Curriculum for Semester I

Curriculum for Semester I

Coursecode:IT-111 T Course Title:ComputerFundamentals

Total Credit: 2 Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Prerequisites:

There are no prerequisites required for attending this course.

Learning objects

To impart basic introduction to computer hardware, components, computer number system. How the CPU works, fundamental about algorithms and flowchart as well as different types of software.

Learning outcomes

- Students who complete this course successfully will acquire:
- Knowledge of computer fundamental, CPU and its functionalities.
- Understanding of block diagram of hardware peripherals.
- Understanding the concepts of software and its types.
- Understanding the number of system and its conversion between different numbers of systems.
- Understanding the computer based application such as email and video conferencing.

Course Outline

UNIT – 1

1. Fundamentals of ComputerSystem

- Characteristics & features ofComputers.
- Components ofComputers.
- Organization ofComputer.

2. Computer Generation &Classification

- Generation of Computers : First toFifth
- Classification of Computers : Distributed & Parallelcomputers

UNIT – II.

3. Computer Memory

- Memory Cell &Organization
- Types of Memory (Primary And Secondary) : RAM , ROM , PROM ,EPROM, advantages and disadvantages of each.
- Secondary Storage Devices (FD, CD, HD, Pen drive, DVD, Tape Drive, DAT)

4. I/O Devices

- Input Devices : Touch screen , OMR, OBR , OCR, Light pen, Scanners
- Output Devices: Digitizers, Plotters, LCD, Plasma Display, Printers

UNIT – III

5. Processor

- Structure of Instruction , Description of Processor , Processor Features
- RISC & CISC

UNIT – IV

6. Internet, World Wide Web:

Introduction to Internet, Internet Access, Internet Basics, Protocols-TCP/IP, HTTP, FTP, Addressing, World Wide Web (WWW), Web Pages & HTML, Web browsers, Searching for information-search engines. Internet chat. Applications of Internet. Advantages and Disadvantages of Internet.

UNIT – V: Test and Tutorials.

Text Books:

1. Fundamentals of Information Technology; By Chetan Srivastava, Kalyani Publishers
2. Fundamentals of Computers: By V. Rajaraman, PHI Publication , IVth Edition.
3. Fundamentals of Programming: By Raj K. Jain, S. Chand Publication

Reference Books:

1. Computer Fundamental By B. Ram, BPB Publication.

UNIT – 1

1. Number Systems andArithmetic

- Number System : Decimal , Octal , Hexadecimal & Binary Number System
- Conversion within Binary, Octal, Hexadecimal & Decimal Number System.
- Binary Arithmetic : Binary addition, subtraction, multiplication & division
- Binary subtraction using 1' complement, 2's complement method.
- Hexadecimal arithmetic: Addition, subtraction, multiplication & division

2. Boolean Algebra and LogicGates

- Postulates of Boolean Algebra
- Theorems of Boolean Algebra: Complementation , commutative, AND, OR, Associative, Distributive, Absorption laws , De morgan's theorems
- Reducing Boolean expressions
- Logic Gates : AND, OR, NOT, Ex-OR, Ex-NOR
- NAND as Universal building block
- Logic diagrams of Boolean expressions Boolean expressions for logic diagrams
-

Unit – II

3. MinimizationTechniques

- Introduction , Minterms and Maxterms
- K-Map, K-map for 2 variables
- K-map for 3 variables
- K-map for 4 variables

4. Combinational and Arithmetic LogicCircuits

- Half Adder & Full Adder
- Binary parallel Adder
- Half Subtractor, Full Subtractor
- Adder/Subtractor in 2's complement system
- BCD to Decimal decoder
- 2 : 4 demultiplexer
- 4 line to 1 line multiplexer

Unit – III

5. FlipFlops

- Introduction : RS FF
- Clocked RS FF, D FF
- Triggering, preset and clear
- JK FF , T FF , Race around condition
- Master slave FF

Unit- IV

6. Counters

- Introduction : Asynchronous/ ripple counter
- Modulus Counter , MOD-12 counter
- Synchronous counter : Synchronous serial & synch parallel counter
- BCD counter
- Ring counter

7. ShiftRegisters

- Introduction, Buffer register
- Serial- in serial -out Serial-in parallel-out
- Parallel-in serial-out, parallel-in parallel-out

UNIT – V: Test and Tutorials.

Text Book:

- 1.DigitalElectronicsandMicro-Computers–R.K.Gaur , Dhanpat Rai Publication

Reference Book:

- 1.DigitalElectronicsandLogicDesign–N.G.Palan, TechnovaPublication

Course Code : IT-113 T

Course Title : Operating System I

Total Credit: 2 Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Prerequisites:

There are no prerequisites for attending this course.

Learning Objectives

- To introduce students the basic functioning of operating systems as resource manager and its salient features.
- To acquaint students about Process States, CPU Scheduling, Inter Process Communication, Synchronization, Deadlocks.

Learning Outcomes

Upon successful completion of the course, the students will:

- Gain knowledge of System Software, Program and Process.
- Understand Types of Operating System, Basic functions of O.S. and Evolution of O.S.
- Understand the concept of Process, Process Control Block and Threads.
- Understand the CPU scheduling Non-Pre-emptive and Pre-emptive Scheduling algorithms
- Understand the concept of Synchronization and Deadlock.

Course Outline

Unit I: Introduction to Operating System:

Introduction to Software: Definition, Classification of software, Operating system as the main component of system software, Program and Process.

Operating System Fundamental : O.S. as a resource manager, Structure of O.S., Types of O.S.- Single user and multiuser O.S., Basic functions of O.S., Characteristics of modern O.S.**Evolution of O.S. :** Early systems, Simple batch systems, Multiprogramming batch systems, Time sharing system, Operating system for Personal Computers, workstations and Hand held devices, Parallel systems, Distributed systems, Real time systems, Advantages and Disadvantages of each system.

Unit II: Process Management:

Concept of Process: Process States, Process Control Block, Operations on Processes, Threads.

CPU Scheduling: Types of schedulers, Criteria for scheduling, Non-Pre-emptive Scheduling Algorithms – First-come First-served Scheduling and Shortest Job First Scheduling, Pre-emptive Scheduling Algorithms- Priority Scheduling, Round Robin.

Unit III: Inter Process Communication and Synchronization:

Concurrent and dependent process, need for synchronization, introduction of Critical Section and Semaphores, method of inter process communication, process synchronization, synchronization problem.

Unit IV: Deadlock

Deadlocks :Concept of Deadlock, Deadlock Modeling, Methods for Handling Deadlock.

Memory Management

UNIT – V: Test and Tutorials.

Reference Books:

1. "Operating System", By S.R. Sathe & Anil S. Mokhade, MacMillan Publication.
2. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.
3. A.S. Tanenbaum, Modern Operating System, 3rd Edition, Pearson Education 2007.
4. G. Nutt, Operating System: A Modern Perspective, 2nd Edition Pearson Edition 1997.
5. W. Stallings, Operating Systems, Internals & Design Principles 2008 5th Edition, Prentice Hall of India.
6. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

Course code: IT-114 T

Course Title: Programming in C

Total Credit: 2 Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

UNIT – I

1. Introduction:

- An Overview of C , History of C language, C as a Structured Language, Features of C.

2. Basic Elements & Operators

- Character set, C Token, Identifier & Keywords, Variables
- Constant and its types. Integer constant, floating point constant, character constant, string constants.
- Operators: Arithmetic, Relational, Logical, Unary operators: Increment & decrement Assignment and Conditional operator.
- Precedence & Associativity of Operators

3. Data Types

- Data Types: *int, char, float, double*. Declaration & Initialization.
- Type modifier: long, short, signed & unsigned

UNIT – II

4. C Program & I/O statements

- Structure of C Program, Compilation & Execution of C program
- I/O: Introduction, Formatted Input/Output function: *scanf* & *printf*, Escape sequence characters.
- Library functions: General & Maths.

Unit-III

5. Control and Iterative Statements:

- Simple if, nested if, if-else, else if ladder
- Switch-case statement
- The conditional expression (*?:* operator)
- while and do-while loop, and for loop
- break & continue statement, goto statement

UNIT – IV

6. Arrays:

- Introduction, Declaration and initialization Accessing array elements, Memory representation of array.
- One dimension and multidimensional arrays, character array, Introduction to string.

Unit-V : Test and Tutorial

Text Books::

- | | | | |
|----|------------------|--------------------|---------------------|
| 1. | Let us C | : Y.P. Kanetkar | [bpb publication] |
| 2. | Programming in C | : E. Balaburuswamy | [Tata macgraw hill] |
| 3. | Programming in C | : Goterfried | [Shaums' Series] |

Reference Books:

Course Code : IT-115 T Course Title : Mathematical Foundation

Total Credit: 2

Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Prerequisites:

Basic understanding of mathematical concepts (School or Junior College).

Learning Objectives

To expose the students to the following:

- Propositional function, statements, well-formed formulas.
- Set theory concepts like Finite Set, Subset, Empty Set and operations on set.
- Matrices and its various types.
- Binary relations, posets, Functions, and pigeonhole principle.
- Algebraic structures like groups and elementary combinatorics.
- Various concepts in graphs and trees like its representation and its types.

Learning Outcomes

After successful completion of course the student should be able to

- Know how to represent various statements using set, relations, functions, permutations and combinations, groups, graphs and trees
- Use logical notations to formulate and reason about fundamental mathematical concepts such as sets, relations, functions and algebraic structures.
- Analyse the growth of functions and real-world problems using various concepts like recurrence relations, graph implementation etc.
- Apply mathematical logic to solve problems, pigeonhole principle to solve real time problems,
- Model and solve real world problems using graphs and trees.

Course Outline

Unit I: Mathematical Logic:

Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Normal Forms.

Set Theory:

Types of Set: Finite, Infinite, Singleton, Empty, Subset, Proper Subset, Universal Set, Power Set, Venn Diagram, Operations on Set: Union of Sets, Intersection of Sets, Complement of Set, Cartesian Product, Difference and Symmetric Difference of Set.

Introduction to Matrices: Types of Matrices, Matrix, Operations, Adjoint and Inverse of a Matrix, Rank of a Matrix and Special Matrices.

Unit II Combination:

Review of Permutation and Combination, Mathematical Induction - Pigeon hole principle, Principle of Inclusion and Exclusion, generating function, Recurrence relations.

Unit III: Basics of Graph Theory and Tree:

Introduction to Graph, Application of Graph, Finite and Infinite Graph, Incidence and Degree, Null Graph, Isolated and Pendent Vertex, Isomorphism, Subgraph, Walks, Path and Circuit, Union and Intersection Operation. Graph, Planner Graph, Trees, Pendant Vertices on Tree, Binary Tree, Spanning Tree.

Unit IV: Relation:

Basic definitions of Relation and types of Relations, Graph of Relations, Properties of Binary Relations, Matrix Representation of Relations, Operations on Relations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering Relations.

Unit-V: Test and Tutorials

Text Books:

1. Elements of Discrete Mathematics-A Computer Oriented Approach C. L. Liu, D.P. Mohapatra, 3rd edition Tata McGraw Hill.
2. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, Tata McGraw Hill
3. Foundations of Computer Science, A. Aho and J. Ullman- W. H. Freeman, 1992.
4. Discrete Mathematics-Dr. Bembalkar

Reference Books:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J. L. Mott, A. Kandel, T.P. Baker, 2nd Edition, Prentice Hall of India.
2. Discrete Mathematical Structures, Bernard Kolman, Robert C. Busby, Sharon Cutter Ross, Pearson Education/PHI.
3. Discrete Mathematics and its Applications with Combinatorics and Graph Theory, K. H. Rosen, 7th Edition, Tata McGraw Hill.

Course code : IT-116 T Course Title : Programming Methodology

Total Credit: 2 Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Prerequisites:

There are no prerequisites for attending this course.

Learning Objectives

- Learn to develop simple algorithms and flow charts to solve a problem.
- Develop problem solving skills coupled with top down design principles.
- Learn about the strategies of writing efficient and well-structured computer algorithms/programs.
- Develop the skills for formulating iterative solutions to a problem.

Learning Outcomes

- Learn the History and types of Programming.
- Learn various approach of writing program.
- Learn to develop simple algorithms and flow charts to solve a problem.

Unit I: Introduction to Programming Environment

Introduction to Programming, Definition of program and programmer, features of good programming language, Bugs and Debugging,

Programming Techniques

Programming approaches: Types of programming methodologies, Procedural Programming, Functional Programming, Structural Programming, Modular Designing, Logical Programming -Top Down Designing, Bottom Up Designing, Object Oriented Programming

Unit II: Programming Languages

History of languages, Classification of computer language: Types of Programming Languages- Machine Languages , Assembly Languages, High Level Languages, low level language, Structure Language, Object oriented Language, Modular techniques, Modular Programming – advantages, identifying the modules, step-by-step solution, control structures, decision control structures, selection control structures, loop control structures, 4GL, Assembler, Linker, Loader, Interpreter & Compiler, TASM, Debug

Unit III: Algorithm

Definition, Characteristics , Advantages and disadvantages, Pseudocode or Structured English, Algorithm, basic features and properties of algorithm.

Unit IV: Flowchart

Flow-Chart

Definition, Principles of flowcharting, Flowcharting symbols, Data flow diagram, pseudocode. converting algorithms to flowcharts, problem solving through algorithm and flowchart. Advantages and disadvantages

Books :

1. Fundamentals of Computer V. Rajaraman
2. Programming Logic and Design, Comprehensive By Joyce Farrell
3. Problem Solving and Program Design in C, J. R. Hanly and E. B. Koffman, Pearson, 2015.

Course code : IT-131 T Course Title : English Communication Skill
(linguistic approach)

Total Credit: 3 Marks: 50 (UA: 40 + IA: 10)

Periods: 5 per week (50 Minutes each)

Prerequisites:

There are no prerequisites for attending this course.

Learning Objectives

- Learn fundamentals of Parts of Speech.
- Detailed study of Spellings, Silent letters and Articles.
- Learn Auxiliary verbs, Subject and Object and how to make Questions and Question tags.
- Addressing the Greetings and giving directions.
- To enhance the vocabulary-building, word formation, Synonyms & Antonyms, One-word substitutes and Phrasal verbs.
- To improve listening, oral and reading skills

Learning Outcomes

Upon successful completion of the course, the students will be able to:

- Understand the different styles of communication.
- Understand the effective speaking skills and develops effective reading comprehensions.
- Understand how to write a good personal profile and improve one's presentation skills.
- Develop good writing skills.

Course Outline

Unit I: Basics of Communication Skill:

Communication Skills: Introduction, Definition, Nature and Scope of Communication, an Importance and Purpose of Communication, 'C's of good communication, Process of Communication. **Barriers to communication:** Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers. **Communication Network in Organization:** Personal Communication, Internal Operational Communication, External Operational Communication, Horizontal (Lateral) Communication, Vertical (Downward) Communication, Vertical (Upward) Communication.

English Grammar:

Parts of Speech: Nouns, Pronouns, Verbs, Adverbs, Adjectives, Conjunctives, Prepositions, Interjections. Using the **Dictionary:** Primary Auxiliaries, Modal Auxiliaries, Subject and Object (Direct/Indirect), Yes or No Questions, Wh-word Questions, Question Tags. **Grammar:** Type of Verbs, Subject- Verb Agreement, Tense (present and past) and Aspect, several possibilities for denoting future Time, vocabulary building, constructing paragraphs

Unit II: Elements of Communication&Listening Skills:

Elements of Communication: Introduction, Face to Face Communication – Tone of voice, Body Language (Non-Verbal Communication), Verbal Communication, Physical Communication.**Listening Skills-I:** Introduction, Listening to Conversation (Formal and Informal), Active Listening, Benefits of Listening Skill, Barriers to Listening, Listening to Announcements (Railway stations/Bus stations/ Airports/ Sports Announcements/ Commentaries etc.)**Listening Skills-II:** Academic Listening (Listening to Lectures), Listening to Talks and Presentations, Note Taking Tips.

Unit III:Oral Communication Skills:

Importance of Spoken English, Status of Spoken English in India, International Phonetic Alphabet (IPA) Symbols, Spelling and Pronunciation, Requesting and responding to requests, Congratulating people on their success, Expressing condolences, Apologizing and forgiving, Giving instructions, Seeking and giving permission, Expressing Opinions (likes and dislikes), Demanding Explanations, Asking for and giving advice and suggestions.
Reading Skills: Purpose, Process, Methodologies, Skimming and Scanning, Levels of Reading, Reading Comprehension.

Unit IV: EffectiveWriting Skills:

Elements of Effective Writing, Sentences, Phrases and Clauses, Types of Sentences. Main Forms of Written Communication, Paragraph Writing (Linkage and Cohesion), Letter Writing (Formal and Informal), Essay Writing, Notices, Summarizing, Precise Writing, Note-Making, Amount of Discussion RequiredUnderstanding and Applying Vocabulary: Words Often Confused-Pairs of words, One Word Substitutes, Synonyms and Antonyms, Word Formation: Prefixes, Bases and Suffixes (Derivational & Inflectional).

Unit V: Test and Tutorial

Reference Books:

- 1.**Basic communication skills for Technology**, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011
2. **Communication skills**, Sanjay Kumar, Pushpalata, 1stEdition, Oxford Press, 2011
3. **Organizational Behaviour**, Stephen.P. Robbins, 1stEdition, Pearson, 2013
4. **Brilliant- Communication skills**, Gill Hasson, 1stEdition, Pearson Life, 2011
5. **Business Communication**, By Urmila Rai &S.M.Rai. Himalaya Pub
6. **Business Communication** Anjali Ghanekar
7. **Anderson, Kenneth**. Joan Maclean and Tony Lynch. Study Speaking: A Course in Spoken English for Academic Purposes. Cambridge: CUP, 2004.

Course code : IT-121 P Course Title : Practical based on IT-111T and IT-112 T

Total Credit: 1.5

Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Sample List of experiments to be carried out based on the course **IT-111T**.

1. Prepare a report based on computer component such as monitor, printer, CPU, Pen drive, CD –ROM , Hard Disk.
2. Create a partition of computer drive creation, formatting the drive and deleting the partition.
3. Create a user and password of computer user and Reset a computer password using CMOS battery.
4. Practical on office word tool as a creation, edit, insertion of table in the new word file.
5. Practical based on Ms-Excel for creation of student data with name, marks, roll no for sorting and mark sheet creation.
6. Perform practical of DOS internal commands. DIR, TYPE, DEL, MD, CD, COPY, RMDIR, VER, DATE, TIME, CLS EXIT.
7. Write a comparative report of different web browser such as opera, Microsoft edge, chrome and Mozilla Firefox.
8. Create an IP setting and home network setting for the computer.
9. Connect internet using wifi for a computer.
10. Create an email account based on Gmail and send the email using the parameter as CC, BCC and schedule send option.
11. Practical based on online meeting using zoom, Google meet and Skype
12. Practical based on remote desktop using any desk software.

Sample List of experiments to be carried out based on the course **IT-112T**.

13. Study and Testing of measuring instruments: Digital and Analog multimeters, CROs and Signal Generators – measurement of AC & DC voltages, measurement of frequency.
14. Study of Components: Identification and testing of resistors, capacitors, inductors, diodes, LEDs & transistors
15. Study of Logic Gates: Study of truth table of basic gates, realization of Boolean functions
16. Study of Half adder and Full Adder
17. Study of Half Subtractor and Full Subtractor
18. Study of Implementation of a 3:8 decoder,
19. Study of 4-line to 16 bit decoder
20. Study of BCD to 7-segment decoder

21. Study of Generating a Boolean expression with a multiplexer
 22. Study of Clocked JK Flip Flop
 23. Study of 4-bit ripple counter
 24. Study of Parallel-in, serial-out, 4-bit shift register
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Course code : IT-122 P Course Title : Practical based on IT-113 T and IT-114 T

Total Credit: 1.5

Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Sample List of experiments to be carried out based on the course **IT-113T**.

Note : Implement any three programs from each unit.

Suggestive program list.

1. Write a program to implement scheduling algorithm FCFS.
2. Write a program to accept list of processes arrival time display Giant Chart for FCFS.
3. Write a program to implement SJF Scheduling.
4. Write a program to implement Round Robin Algorithm.
5. Write a program to implement propriety Scheduling.

Sample List of experiments to be carried out based on the course **IT-114T**.

Practical no	Details
1	Implement the following programs a) Write a program to find area of circle b) Write a program to find average of three numbers
2	Implement the following using if-else a) Write a program to find maximum amongst 2 numbers b) Write a program to check entered number is even or odd
3	Implement the following using else-if ladder a) Write a program to find entered number is positive, negative or zero b) Write a program to print grade of students based on percentage
4	Implement the following using switch-case a) Write a program to print weekday based on given number b) Write a program to check entered character is vowel or not
5	Implement the following using while loop a) Write a program to find factorial of given number b) Write a program to find sum of first 10 natural numbers
6	Implement the following using do while loop a) Write a program to print odd numbers from 1 to N b) Write a program to print Fibonacci series
7	Implement the following using for loop a) Write a program to print following series 1 2 3 4 5 6 b) Write a program to print prime numbers from 1 to 100
8	Implement the following using 1-D array a) Write a program to find largest element in an array b) Write a program to sort an array elements in ascending order
9	Implement the following using 2-D array a) Write a program to find sum of two matrices b) Write a program to perform transpose of matrix

Course code : IT-123 P Course Title : Practical based on IT-115 T and IT-116 T

Total Credit: 1.5

Marks: 50 (UA: 40 + IA: 10)

Periods: 3 per week (50 Minutes each)

Sample List of experiments to be carried out based on the course **IT-115T**.

Practical No.	Details
1.	Practical based on Mathematical Logic.
2.	Practical based on Set Theory: Algebra of Set Operations
3.	Representation of set using Venn Diagram
4.	Practical based on various Operations on Set. (Union, Intersection, Difference, Complement)
5.	Write an algorithm and draw the Flowchart to find determinant of Square Matrix.
6.	Write an algorithm and draw the Flowchart to find Adjoint of Matrix, Inverse of Matrix.
7.	Write an algorithm and draw the Flowchart to find Rank of Matrix.
8.	Representation of Principle of inclusion and exclusion.
9.	Write an algorithm and draw the Flowchart based on Permutation. (a) Write an algorithm and draw the Flowchart to find permutation of distinguishable objects. (b) Write an algorithm and draw the Flowchart to find nPr with repetitions.
10.	Write an algorithm and draw the Flowchart based on Combination. (a) Write an algorithm and draw the Flowchart to generate all combinations of 1,2 and 3. (b) Write an algorithm and draw the Flowchart to find nCr with repetitions.
11.	Representation of Graph and tree.
12.	Practical based on binary relations and operations on relations.

Sample List of experiments to be carried out based on the course **IT-116 T**. Faculty can add experiments of their choice as well.

Write 10 algorithms on any general problems and draw flowchart of the same.

Important Notes:

- i) **Nomenclature:** DSC- Discipline Specific Core course, SEC – Skill Enhancement Course, AECC- Ability Enhancement compulsory course, DSE- Discipline Specific Elective, UA- University Assessment (Semester End), CIA-Continuous Internal Assessment.
- ii) **There shall be one skill enhancement course (SEC) IIIrd to VIth Semester (any one SEC course to be chosen (any one from three optional subjects) from the basket of SEC courses for the respective semester.**
- iii) **Code description:** XXX code has to be decided by BoS of the respective subject while designing their respective curriculum (e.g. for Physics it will be PHY; for Electronics it will be ELE)
 - The codes for first semester courses will start from XXX-111, Second-semester courses will start from XXX-211 and so on
 - XXX-111 : The first digit indicate the Semester Number, the second two digits indicate paper numbers for the first-semester courses and the same analogy is for the remaining semesters
 - The codes for theory courses will start from XXX-111 (for the first semester and the same analogy is for the remaining semesters)
 - The codes for practical courses will start from XXX-121 (for the first semester and the same analogy is for the remaining semesters)
 - The codes for Ability Enhancement compulsory courses will start from XXX-131 (for the first semester and the same analogy is for the remaining semesters)
- iv) **Assessment:** 80% for University Assessment (Semester End Examination) and 20 % for Continuous Internal Assessment (CIA)
- v) **Continuous Internal Assessment (CIA): Theory** (10 Marks): Internal Test 05 Marks (Two Internal Tests of 05 marks each and average of the two test will be considered) and 05 Marks for Assignment/tutorials.
- vi) **Continuous Internal Assessment (CIA): Practical** (10 Marks): 07 Marks for Internal Practical Examination and 03 Marks for record book/submission of collection and field survey report and excursion report
- vii) **Practical examination :** Annual examination



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