ARYAVART INTERNATIONAL UNIVERSITY

Tilthai, Dharmanagar, North Tripura-799250

Syllabus for B Sc (IT)

Semester 1

Theory									
Course Code	Topic	L	T	P	Credit	Theory Marks	Internal Marks	Practical Marks	Total Marks
24CS101	Fundamentals of IT	4	0	0	4	70	30	0	100
24CS102	C Programming	4	0	0	4	70	30	0	100
24MT101	Discrete Mathematical Structure	4	0	0	4	70	30	0	100
24EN102	Business Communication	3	1	0	4	70	30	0	100
24CM101	Accounting and Financial Management	4	0	0	4	70	30	0	100
Practical									
24CS191	IT Lab	0	0	2	2	0	30	70	100
24CS192	C Programming Lab	0	0	2	2	0	30	70	100
	Total				**24**	**350**	**210**	**140**	**700**

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Detailed Syllabus

FUNDAMENTALS OF IT

Code: 24CS101

Max Marks: 70

UNIT I (12 Hrs)

Fundamentals of Computers: Definition and Characteristics of Computer System. Computer Generation from First Generation to Fifth Generation. Classifications of Computers: Micro, Mini, Mainframe and super computers.
Computer Hardware: Major Components of a digital computer, Block Diagram of a computer, Input-output devices, Description of Computer Input Units, Output Units, CPU.
Computer Memory: Memory Hierarchy, Primary Memory – RAM and its types, ROM and its types, Secondary Memory, Cache memory. Secondary Storage Devices - Hard Disk, Compact Disk, DVD, Flash memory.

UNIT II (12 Hrs)

Interaction with Computers: Computer Software: System software: Assemblers, Compilers, Interpreters, linkers, loaders.
Application Software: Introduction to MS Office (MS-Word, MS Power point, MS-Excel).
Operating Systems: Elementary Operating System concepts, Different types of Operating Systems.
DOS: Booting sequence; Concepts of File and Directory, Types of DOS commands.
Computer Languages: Introduction to Low-Level Languages and High-Level Languages.

UNIT III (12 Hrs)

Computer Number System: Positional and Non-positional number systems, Binary, Decimal, Octal and Hexadecimal Number Systems and their inter-conversion.
Binary Arithmetic: Addition, subtraction, multiplication and division. Use of complement method to represent negative binary numbers, 1's complement, 2's complement, subtraction using 1's complement and 2's complement. Introduction to Binary Coded Decimal (BCD), ASCII Codes, EBCDIC codes.

UNIT IV (10 Hrs)

Computer Network & Internet: Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), Basics of Internet and Intranet.
Internet: Terminologies related to Internet: Protocol, Domain name, Internet Connections, IP address, URL, World Wide Web. Introduction to Client-Server Model, Search Engine, Voice over Internet Protocol (VOIP), Repeater, Bridge, Hub, Switch, Router, Gateway, Firewall, Bluetooth technology.
Advanced Trends in IT Applications: Brief Introduction to Cloud Computing, Internet of Things, Data Analytics, AI and Machine Learning.

Text Book:

1. P. K. Sinha & Priti Sinha, "Computer Fundamentals", BPB Publications, 1992.
2. Anita Goel "Computer Fundamentals", Pearson.

Reference Books:

1. B. Ram, "Computer fundamentals Architecture and Organization", New Age Intl.
2. Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing.
3. Norton Peter, "Introduction to Computers", 4th Ed., TMH, 2001.
4. Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi, 2004.

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C PROGRAMMING

Code: 24CS102

Max Marks: 70

UNIT I (8 Hrs)

Computer Programming: Basic Programming concepts, Modular programming and structured programming, Problem solving using Computers, Concept of flowcharts and algorithms.

Overview of C: Introduction, Importance of C, Sample C Programs, Basic structure of C programs, Programming style, Executing a C Program.

Constants, Variables and Data types: C Tokens, keywords, and identifiers, constants, variables, datatypes, declaration of variables, assigning values to variables, defining symbolic constants.

Operators and Expressions: Arithmetic operators, Relational operators, Logical operators, Assignment operators, increment and decrement operators, conditional operator, bitwise operators, type conversion in expressions, operator precedence and associativity.

Mathematical functions.

UNIT II (12 Hrs)

Input and Output statements, reading a character, writing a character, formatted input, formatted output statements.

Decision-making, Branching and Looping : Decision making with IF statement, simple IF statement, The IF-ELSE statement, nesting of IF .. ELSE statements, The ELSE -IF ladder, The switch statement, The operator, The GOTO statement, The WHILE statement, The DO statement, The FOR statement, Jumps in loops.

UNIT III (10 Hrs)

Arrays: One dimensional arrays, Two-dimensional arrays, Initializing arrays, Programs based on arrays such as sorting, Fibonacci sequence, Matrix operations, etc.

Handling of Characters and Strings: Declaring and initializing string variables, Reading string from terminal, Writing string to screen, Arithmetic operations on characters, Putting strings together. Comparison of two strings, Character and string handling functions.

UNIT IV (8 Hrs)

User defined functions: Need for user-defined functions, A multi-functional program, The form of 'C' function, Return values and their types, Calling a function, Category of functions: No arguments and no return values, Arguments but no return values, Arguments with return values, Nesting of functions, Recursion, Functions with arrays as parameters.

UNIT V (5 Hrs)

Structure and Union: Structure definition, Giving values to members, Structure initialization; Comparison of structure variables, Array of structures, Array within structure, Union.

Pointers: Understanding pointers, Accessing the address of variables, Declaring and initializing pointers, Accessing a variable through its pointer.

Text Book:

1. Kamthane, Programming with ANSI and Turbo C; Pearson Education 2003

Reference Books:

1. E.Balaguruswamy. : Programming in ANSI C", Tata McGraw-Hill (1998)
2. Yeshvant Kanetkar: "Let us C"
3. V.Rajaraman.: "Programming in C", PHI (EEE) (2000)
4. Rajesh Hongal : "Computer Concepts & C language"
5. Brain Kernighan & Dennis M. Ritchie "ANSI C Programming" (PHI)

DISCRETE MATHEMATICAL STRUCTURE

Code: 24MT101

Max Marks: 70

UNIT I (13 Hrs)

SETS: Sets, Subsets, Equal Sets, Universal Sets, Finite and Infinite Sets, Operations on Sets: Union, Intersection difference and Complements of Sets, Algebra of sets, Cartesian product, Simple applications.
RELATION AND FUNCTIONS: Properties of Relations, Equivalence Relation, Partial Order Relation, Composition of relations and Representation of relations using digraph and Matrix, Function: Domain and Range, onto, into and One to One Functions, Composite and Inverse Functions, Hashing functions, Recursive function.
PROPOSITIONAL LOGIC: Introduction, Proposition, First order logic, Basic logical operations, Truth tables, Tautologies, Contradictions, Algebra of Propositions, Logical implications, Logical equivalence, Predicates, Universal and existential quantifiers.

UNIT II (10 Hrs)
PARTIAL ORDER RELATIONS AND LATTICES: Partial Order Sets, Totally ordered set, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal elements, Greatest lower bound, least upper bound, Lattices and Algebraic Structure, Principle of Duality, Elementary Properties of Lattices, Atoms. Sub lattices, Bounded lattice, Distributed & Complemented Lattices, Isomorphic lattices. Boolean lattice.

UNIT III (11 Hrs)
COMBINATORICS: Introduction, Basic Counting Principles, Permutations, Permutations of things not all different, Circular Permutations, Combinations, Restricted Permutations and Combinations, Derangement, Pascal's Triangle, Binomial Theorem (only for natural Numbers).
RECURRENCE RELATIONS: Introduction, Order of Recurrence Relations, Degree of Recurrence Relations, Linear Homogeneous Recurrence Relations, Non Homogeneous Recurrence Relations, Solution of linear homogeneous and non-non homogeneous recurrence relations.

UNIT IV (10 Hrs)
GRAPHS: Introduction, Degree of a vertex of a graph, Handshaking Theorem, Types of Graphs, Sub graph, Matrix representation of a graph: adjacent and incidence matrices, Isomorphic graphs, Path and circuit (Floyd's and Warshall algorithms), Connected graph, Hamiltonian graph, Euler graph, Graph coloring (Vertex, Edges and Map).

Text Book:

1. Rosen, K.H., Discrete Mathematics and its Applications, McGraw Hill Education, 8th edition 2021
2. Kolman, Busby and Ross, "Discrete Mathematical Structures", Pearson, 10th edition 2015
3. Babu Ram, "Discrete Mathematics", Pearson Education, 1st edition 2010

Reference Books:

1. D. S. Malik, M. K. Sen, "Discrete Mathematics" Cengage Learning, 2012
2. RB2. S.K. Sarkar "A Text Book of Discrete Mathematics" S. Chand Publications, 9th edition 2019
3. RB3. Singh J. P. "Discrete Mathematics for Undergraduates" ANE Books, 1st edition, 2013
4. RB4. Tremblay J.P. and Manohar, R., "Discrete Mathematical Structures with Applications to Computer Science" Tata McGraw Hill

BUSINESS COMMUNICATION

Code: 24EN102

Max Marks: 70

UNIT I (10 Hrs)

Concepts and Fundamentals: Introduction to Technical Communication, Need and importance of communication, Channel, Distinction between general and technical communication, Nature and features of technical communication, Seven Cs of communication, Types of Technical communication, Style in technical communication, Technical communication skills, Language as a tool of Communication, History of development of Technical Communication, Computer Aided Technical Communication

UNIT II (12 Hrs)

Oral Communication: Principles of effective oral communication, Introduction of Self and others, Greetings, Handling Telephone Calls Interviews: Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential, Techniques of interviewing, Guidelines for Interviewer, Guidelines for interviewee. Meetings: Definition, Kind of meetings, Agenda, Minutes of the Meeting, Advantages and disadvantages of meetings/ committees, Planning and organization of meetings. Project Presentations: Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation). The technique of conducting Group Discussion and JAM session.

UNIT III (12 Hrs)

Written Communication: Overview of Technical Writing: Definition and Nature of Technical Writing, Basic Principles of Technical Writing, Styles in Technical Writing.

Note – Making, Notice, E-mail Writing.

Writing Letters: Business letters, Persuasive letters- Sales letters and complaint letters, Office memorandum, Good news and bad news letters.

Report Writing: Definition & importance; categories of reports, Elements of a formal report, style and formatting in report.

Special Technical Documents Writing: Project synopsis and report writing, Scientific Article and Research Paper writing, Dissertation writing: Features, Preparation and Elements.

Proposal Writing: Purpose, Types, characteristics and structure.

Job Application: Types of application, Form & Content of an application, Drafting the application, Preparation of resume.

UNIT IV (10 Hrs)

Soft Skills: Business Etiquettes – Professional Personality, Workplace Protocols, Cubicle. Non-Verbal Communication: Kinesics and Proxemics, Paralanguage.

Interpersonal Skills.

Language Skills: Improving command in English, improving vocabulary, Choice of words, Common problems with verbs, Adjectives, adverbs, Pronouns, Tenses, Conjunctions, Punctuations, Prefix, Suffix, Idiomatic use of prepositions. Sentences and paragraph construction, Improve spellings, Common errors and misappropriation, Building advanced Vocabulary (Synonyms, Antonyms), Introduction to Business English.

Text Book:

1. Kavita Tyagi and Padma Misra , “Advanced Technical Communication”, PHI, 2011
2. P.D.Chaturvedi and Mukesh Chaturvedi, “Business Communication – Concepts, Cases and Applications”, Pearson, second edition.
3. Rayudu, “C. S- Communication”, Himalaya Publishing House, 1994.
4. Asha Kaul, “Business Communication”, PHI, second edition.

Reference Books:

1. Raymond Murphy, "Essential English Grammar- A self study reference and practice book for elementary students of English" , Cambridge University Press, second edition.
2. Manalo, E. & Fermin, V. (2007). Technical and Report Writing. ECC Graphics. Quezon City.
3. Kavita Tyagi and Padma Misra , "Basic Technical Communication", PHI, 2011.
4. Herta A Murphy, Herbert W Hildebrandt and Jane P Thomas, "Effective Business Communication", McGraw Hill, seventh edition.

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ACCOUNTING AND FINANCIAL MANAGEMENT

Code: 24CM101

Max Marks: 70

UNIT I (15 Hrs)

Introduction – Principles – Concepts & Conventions – Double entry system of accounting – Journal – Ledger. Preparation of trial balance. Subsidiary Books with special reference to simple cash book and three column cash book.

UNIT II (12 Hrs)

Final accounts of sole trader: Adjusting entries, Including reserve for bad debts, Reserve for discount on debtors and creditors, Preparation of final accounts.

UNIT III (08 Hrs)

Introduction – Meaning, Scope, Functions of finance manager. Unit Costing: Preparation of cost sheet.

UNIT IV (12 Hrs)

Ratio analysis: Meaning of ratio – Advantages – disadvantages – types of ratio – usefulness – liquidity ratios – profitability ratios, Efficiency ratios, Solvency ratios.(Theoretical concepts) Funds Flow Statement: Meaning – concepts of funds flow. Cash flow statement :Meaning, Need – Simple problems on cash flow statement.

UNIT V (10 Hrs)

Marginal Costing: Meaning – Definition – Concepts in marginal costing – Marginal equations – P / V ratio – B.E.P – Margin of safety – Sales to earn a desired profit – Problems on above Budgetary control: Meaning – Definition – Preparation of flexible budget and cash budget.

Text Book:

1. Financial Accounting, Ashis Bhattacharya, prentice-Hall India Publication.
2. Prasanna Chandra, Financial Management, Tata McGraw Hill Publications

Reference Books:

1. “Book Keeping and Accountancy” Choudhari, Chopde.
2. “Cost Accounting”: Choudhari, Chopde.
3. “Financial Management” Text and Problems: M.Y.Khan, P.K. Jain.
4. “Financial Management Theory & Practice” Prasanna Chandra Tata McGraw Hill.
5. Managerial Economics & Financial Analysis, Siddiqui S.A. Siddiqui A.S. New Age.

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C PROGRAMMING LAB

(BASED ON 24CS102) C Programming:

CorePracticals(Implementminimum8outof10practical)

1. Write a program to convert temperature from Celsius to Fahrenheit by taking input from the user.
2. Write a program to find the greatest number among 3 numbers given by the user.
3. Write a program to check if a given number is a prime number or not.
4. Write a program to display the following pattern up to N rows, taking the value of N from the user:

```
1
2    3
4    5    6
7    8    9    10
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5. Write a program to input marks of 50 students using an array and display the average marks of the class.
6. Write a program to search for a number entered by the user in a given array and display the array in ascending order.
7. Write a program to check if a string is palindrome or not.
8. Write a program to add, subtract, multiply and divide two numbers using pointers.
9. Write a program to create a structure for employees containing the following data members: Employee ID, Employee Name, Age, Address, Department and Salary. Input data for 10 employees and display the details of the employee from the employee ID given by the user.
10. Write a program to create two files with names EvenFile and OddFile. Input 20 numbers from the user and save even numbers in EvenFile and odd numbers in OddFile.

Application Based Practicals (Implement minimum 5 out of 10 practicals)

11. Write a menu driven program to construct a calculator for following arithmetic operations: addition, subtraction, multiplication, division, average and percentage.
12. Write a menu driven program to perform the following operations:
    (i) Print armstrong numbers upto N,
    (ii) Display prime numbers between 1 to N,
    (iii) Reverse of an integer
13. Write a program to convert a hexadecimal number into a binary number.
14. Write a program to calculate factorial of a number and display fibonacci series upto N terms using recursive functions.
15. Write a program to perform
    (i) matrix addition,
    (ii) matrix multiplication, and
    (iii) Matrix transpose on 2D arrays.
16. Write a program to make use of arrays with structures in the following ways:
    (i) Use array as a structure data member
    (ii) Create array of structure variables

17. Write a program to compare the contents of two files by taking names of the files through command line arguments.
18. WAP to perform I/O and make use of file positioning functions on Binary files. (using fseek, ftell, rewind functions)
19. Write a menu driven program to implement the following string operations:
    (i) Calculate length of a string
    (ii) Concatenate at the end of a given
    (iii) Copy one string to another
    (iv) Compare contents of two strings
    (v) Copy nth character string to another
20. Write a program to read time in string format and extract hours, minutes and second also check time validity

Note:

1. **In total 15 practicals to be implemented. 2 additional practicals may be given by the course instructor.**
2. **This is a suggestive list of programs. However, the instructor may add programs as per the requirement of the course.**

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IT LAB

(BASED ON 24CS101) Fundamentals of IT:
Core Practicals (Implement minimum 10 out of 15 practicals)

1. To explore the System settings - Personalisation, System, Devices, Apps, Network & Internet.
2. To practice basic DOS commands like cd, md, dir, erase, cls, copy, date etc.
3. To explore Windows Explorer functionalities like create, rename, move, delete folder and files etc.
4. To practice the use of basic formatting features - Format Painter, Indentation, Line spacing, background color, find, replace, dictate commands.
5. To practice the use of Bullets, numbering, multilevel lists and use of Table Feature- Insert table with rows and columns, draw tables, excel spreadsheet and quick tables etc.
6. To practice the use of Insert Features – add picture, Chart, SmartArt, WordArt, Equation, Symbols, Header and Footer, Page Numbering etc. and the use of Design Features – Watermark, Page color, Page Border, Themes implementation etc.
7. To practice the use of Layout Features – Margins, Orientation, Size, Columns, Indent, Spacing etc.
8. To practice the use of Mail Merge Feature to generate Envelops and Labels.
9. To practice the use of Excel basic formatting features – Wrap Text, Insert and Delete (Cells, Sheet, Row or Column), Format – Cell Height, Cell Width, Hide, Un Hide Cell, Protection, Freeze and Unfreeze panes, Macros etc.
10. To practice the use of Insert Features- Pivot Table, Pivot Chart, Picture, Chart and its formatting and Design and the use of Page Layout Features- Margins, Orientation, Page Break , Background, Height and Width of Cells.
11. To practice the use of Formula Features – user defined function, pre-defined functions – Logical, Date, Time, Maths and the use of Data Manipulation Features – Sort, Filter, Advanced Filters, Whatif analysis.
12. To practice the creation of Blank presentation and Selecting Themes and the use of the basic design features – Adding New Slides, Reuse slides, Slides layout etc.
13. To practice the use of Insert Features – add pictures, screenshots, shapes, wordart, audio, video, date-time etc. and use of Design Features- Changing the theme of presentation, format background and design ideas.
14. To practice the use of Transition features to be applied on Slides content, setting sound, duration etc. and the use of Animation Features to be applied on presentation of Slide, set animation timings and rehearse etc.
15. To practice the use of Slide Show Features – Custom Slide Show, Rehearse Timing etc.

Application Based Practicals (Implement minimum 5 out of 8 practicals)

16. Create a Folder by your name in your system, store all the work done in this semester inside that folder.
17. Create your Resume using basic formatting features like : table, bullets, wordart etc.
18. Design an Invitation to Birthday Party using mail merge features send the invitation to 10 friends.
19. Write an Article for Magazine with 3 columns and hyperlink.
20. Create your own marksheet using basic formatting features.

21. Create a list of marks of 10 students create charts and pivot table.
22. Prepare a Sales summary and use features like sort, filter etc. to manipulate the data.
23. Create a Power Point Presentation on any topic of your choice using animation and transition features.

Note:

1. **In total 15 practical to be implemented. 2 additional practicals may be given by the course instructor.**
2. **This is a suggestive list of programs. However, the instructor may add programs as per the requirement of the course.**

Theory Paper

Total: 100 Marks
External: 70 Marks
Internal: 30 Marks

External : 70 Marks
10 Question (MCQ): 1 marks each (1x10 = 10)
Answer any 6 out of 8 (Very Short 20-30 Words): 2 marks each (2x6 = 12)
Answer any 6 out of 8 (Short 50-70 Words): 3 marks each (3x6 = 18)
Answer any 6 out of 8 (Long 100-120 Words): 5 marks each (5x6 = 30)

Internal : 30 Marks
Two Internal Assessment Examinations will be conducted, each carrying 50 marks. The higher of the two scores will be considered for the final assessment.

Lab

Practical: 100 Marks
External: 70 Marks
Internal:30 Marks

External (Two programs) : 70 Marks

Program Writing: 10 + 10 Marks
Algorithm& Flowchart : 5 + 5 Marks
Program Execution: 15 + 15 Marks
Viva: 10 Marks

Internal Assessment (30 Marks)
Internal Assessment Examinations will be conducted, carrying 50 marks

Record: 5 Marks
Attendance: 5 Marks
Program Writing: 15 Marks
Program Execution: 15 Marks
Viva: 10 Marks