K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: F.Y.B.Sc.(Computer Science)   **Div:A**

Subject Name:-Database Management System

Subject Teacher :-Prof.Pardeshi P.N.   **Syllabus completed=100%**

Sr. no	Month	Name Of Topics	Allocated Lectures	Conducted lectures
1	November	**Unit 1: Introduction To DBMS** 1.1. Introduction 1.2. File system Vs DBMS 1.3. Levels of abstraction & data independence 1.4.Structure of DBMS (Roles of DBMS Users) 1.5. Users of DBMS Advantages of DBMS	4	8
	December	**Unit 2: Conceptual Design** 2.1. Overview of DB design process 2.2. Introduction to data models (E-R model, Relational model, Network model, Hierarchical model) 2.3. Conceptual design using ER data model (entities, attributes, entity sets, relations, relationship sets) 2.4. Constraints (Key constraints, Integrity constraints, referential integrity, unique constraint, Null/Not Null constraint, Domain, Check constraint, Mapping constraints) 2.5. Extended features – Specialization,	14	15

		Aggregation, Generalization 2.6. Pictorial representation of ER(symbols) 2.7. Structure of Relational Databases (concepts of a table) 2.8. DBMS Versus RDBMS 2.9. Case Studies on ER model.		
2	January	**Unit 3 : SQL** 3.1. Introduction to query languages 3.2. Basic structure 3.3. DDL commands 3.4. DML commands 3.5. Forms of a basic SQL query (Expression and strings in SQL) 3.6. Set operations 3.7. Aggregate Operators and functions 3.8. Date and String functions 3.9. Null values 3.10. Nested Subqueries 3.11 SQL mechanisms for joining relations (inner joins, outer joins and their types) 3.12 Views 3.13. Examples on SQL (case studies) Practical Slip Solving	11	8
4	February	**Unit 4: Relational Database Design** 4.1. Introduction to Relational-Database Design (undesirable properties of a RDB design) 4.2. Functional Dependency(Basic concepts, F+, Closure of an Attribute set, Armstrong's axioms) 4.3. Concept of Decomposition 4.4. Desirable Properties of Decomposition (Lossless join, Lossy join, Dependency Preservation)	8	8

		4.5. Concept of normalization, Normal Forms (1NF,2NF and 3NF), Examples 4.6 Keys Concept with Examples : Candidate Keys and Super Keys, Algorithm to find the super keys / primary key for a relation		

for A/Ѐ

Prof.Pardeshi P.N.

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HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: F.Y.B.Sc. (Computer Science)　　　Div:A

Subject Name- Paper 1 (CS-101): Problem Solving Concept Using Computer and 'C' Programing -I

Subject Teacher- Prof. Kad D.R.　　　　Syllabus Completed: 100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	November	Unit 1: .Problem Solving Aspects 1.1. Introduction to problem solving using computers. 1.2. Problem solving steps. 1.3 Algorithms-definition, characteristics , examples ,advantages and limitations. 1.4 Flowcharts - definition, notations , examples , advantages and limitations, Comparison with algorithms. 1.5 Pseudo codes - notations, examples, advantages and limitations. 1.6 Programming Languages as tools, programming paradigms, types of languages 1.7 Converting pseudo-code to programs. 1.8 Compilation process (compilers , interpreters), linking and loading, syntax and semantic errors, testing a program 1.9 Good Programming Practices	05	09

		(naming conventions , documentation, indentation).		
2	December	**Unit 2: 'C'Fundamentals** 2.1 History of 'C' language. Application areas. 2.2 Structure of a 'C' program. 2.3 'C' Program development life cycle. 2.4 Function as building blocks. 2.5 'C' tokens 2.6 Character set, Keywords , Identifiers 2.7 Variables, Constants (character, integer, float, string, escape sequences, enumeration constant). 2.8 Data Types (Built-in and user defined data types). 2.9 Operators, Expressions, types of operators, Operator precedence and Order of evaluation. 2.10 Character input and output. 2.11 String input and output. 2.12 Formatted input and output	07	14
3	December	**Unit 3: Control Structures** 3.1 Decision making structures:- if ,if-else, switch and conditional operator. 3.2 Loop control structures:- while ,do while, for. 3.3 Use of break and continue. 3.4 Nested structures. 3.5 Unconditional branching (goto statement)	06	13
4	January	**Unit 4 : Functions** 4.1 Concept of function, Advantages of Modular design. 4.2 Standard library functions. 4.3 User defined functions:- declaration , definition, function	06	06

		call, parameter passing (by value), return statement. 4.4 Recursive functions. 4.5 Scope of variables and Storage classes.		
5	February	**Unit 5: Arrays** 5.1 Concept of array. 5.2 Types of Arrays – One , Two and Multidimensional array. 5.3 Array Operations - declaration, initialization, accessing array elements. 5.4 Memory representation of two-dimensional array (row major and column major) 5.5 Passing arrays to function. 5.6 Array applications - Finding maximum and minimum, Counting occurrences, Linear search, Sorting an array (Simple exchange sort, bubble sort), Merging two sorted arrays, Matrix operations (trace of matrix, addition, transpose, multiplication, symmetric, upper/ lower triangular matrix)	06	06

Prof. Kad D.R.

K.T.S.P.MANDAL'S

HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: F.Y.B.Sc.(Computer Science)   Div:A

Subject Name: ELC-111: Semiconductor Devices & Basic Electronic Systems

Subject Teacher:-Prof. Dighe A.R.   Syllabus completed=100%

Sr. no	Month	Name Of Topics	Allocated Lectures	Conducted lectures
1	December	**Unit 1. Semiconductor Diodes** Semiconductor, P and N type semiconductors, Formation of PN junction diode, it's working, Forward and Reverse bias characteristics, Zener diode: working principle, breakdown mechanism and characteristics, Working principle of Light emitting diode, photo diode, optocoupler, Solar cell working principle and characteristics	6	5
2	December	**Unit 2. Bipolar Junction Transistor (BJT)** Bipolar Junction Transistor (BJT) symbol, types, construction, working principle, Transistor amplifier configurations - CB, CC (only concept), CE configuration: input and output characteristics, Definition of α, β and Υ , Concept of Biasing (numerical problems not expected), Potential Divider bias, Transistor as amplifier (Concept of Gain and Bandwidth expected), Transistor as a switch.	7	8

3	January	**Unit 3. MOSFET** MOSFET types, Working principle, Characteristics, Application of MOSFET as a Switch	5	4
4	January	**Unit 4. POWER SUPPLY** Block Diagram of Regulated Power Supply, Rectifiers (half wave, full wave, Bridge), rectifier with capacitor-filter, Use of Zener Diode as a Voltage Regulator, IC 78XX and 79XX as regulator, Block Diagram and explanation of SMPS, Block diagram and explanation of UPS	6	5
5	February	**Unit 5. OSCILLATORS** Barkhauson Criteria, Low frequency Wein-bridge oscillator, High frequency crystal oscillator, IC 555 as astablemultivibrator used as square wave generator / clock Unit	6	5
6	February	**6. DATA CONVERTERS** Need of Digital to Analog converters, parameters, weighted resistive network, R-2R ladder network, need of Analog to Digital converters, parameters, Flash ADC, successive approximation ADC	6	5

Prof.Dighe A.R.

HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: F.Y.B.Sc.(Computer Science) **Div:A**

Subject Name- Paper II (ELC 122): Principles of Digital Electronics

Subject Teacher- Prof.A.P.Kulkarni **Syllabus Completed: 100%**

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	November	**Unit 1: Number Systems and Digital codes** Introduction to Decimal, Binary and Hexadecimal number systems and their inter-conversions, binary addition and binary subtraction using 2's complement, Binary Coded Decimal number, Gray Codes, Gray to Binary and Binary to Gray conversion, Alphanumeric representation in ASCII codes.	8	10
2	December	**Unit 2: Logic gates and Boolean Algebra** Logic gates (NOT, AND, OR, NAND, NOR, XOR gate) with their symbol, Boolean equation and truth table, Universal gates Rules and laws of Boolean algebra, De Morgan's theorem, simplification of Logic equations using Boolean algebra rules, Min terms, Max terms, Boolean	12	17

		expression in SOP and POS form, conversion of SOP/POS expression to its standard SOP/POS form Introduction to Karnaugh Map, problems based on SOP (upto 4 variables), digital designing using K Map for: Gray to Binary and Binary to Gray conversion, Introduction of CMOS and TTL logic families, Parameters like voltage levels, propagation delay, noise margin, fan in, fan out, power dissipation (TTL NAND, inverter, CMOS gates etc. not expected)		
3	January	**Unit 3: Combinational Circuits** Half adder and full adder, 4-Bit Universal adder/ Subtractor, applications of Ex-OR gates as parity checker and generator, study of Multiplexer (4:1) and Demultiplexer (1:4)	07	10
4	February	Encoders - Decimal/BCD to binary, 3X4 matrix keyboard encoder, priority encoder, Decoder- BCD to seven segment decoder, IC 74138 and IC 7447, Digital comparator	03	05

Prof.A.P.Kulkarni

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: F.Y.B.Sc. (Computer Science)　　　　Div:A

Subject Name- Paper I (MTC-111): Matrix Algebra

Subject Teacher- Prof. Karle S.N　　　**Syllabus Completed: 100%**

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	November	**Unit 1 : Introduction** 1.1 Introduction 1.2 Matrix Operations 1.3 The Inverse of a Matrix 1.4 Characterization of invertible matrices 1.5 Matrix Operations 1.6 Vectors in R^3 1.7 Column Defination Of Matrix 1.8 Row Defination Of Matrix !.9 Addition,Substraction,Multipli-Cation of Matrix	04	09
2	December	**Unit 2 : Linear Equations in Linear Algebra-I** 2.1 System of Linear equations 2.2 Row reduction and echelon forms 2.3 Vector equations 2.4 The matrix equation Ax=b 2.5 Solution sets of linear systems	12	14
3	January	**Unit 3 : Linear Equations in Linear Algebra -II**	12	12

		3.1 Partitioned Matrices 3.2 Matrix factorization [Lu decomposition] 3.3 Linear Independence 3.4 Introduction to linear transformation 3.5 The matrix of linear transformation 3.6 Subspaces of Rn 3.7 Dimension and Rank		
4	February	**Unit 4 : Determinants** 4.1 Introduction to determinants 4.2 Properties of determinants 4.3 Cramer's rule, Volume and linear transformations, multiplication, symmetric, upper/ lower triangular matrix)	08	08

Prof. Karle S.N

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: F.Y.B.Sc. (Computer Science)   Div:A

Subject Name- Paper II (MTC-112): Discrete Mathematics

Subject Teacher- Prof. A.R.RaksheSyllabus Completed: 100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	November	**Unit 1 : Logic** 1.1 Revision: Propositional Logic, Propositional Equivalences. 1.2 Rules of Inference: Argument in propositional Logic, Validity Argument(Direct and Indirect methods) Rules of Inference for Propositional Logic, Building Arguments. 1.3 Predicates and Quantifiers: Predicate, n-Place Predicate or, n-array Predicate, Quantification and Quantifiers, Universal Quantifier, Existential Quantifier, Quantifiers with restricted domains, Logical Equivalences involving Quantifiers.	07	07
2	December	**Unit 2 : Lattices and Boolean Algebra** 2.1 Relations, types of relations, equivalence relations, Partial ordering relations 2.2 Digraphs of relations, matrix representation and composition of relations. 2.3 Transitive closure and Warshall's Algorithm	13	16

		2.3 Poset, Hasse diagram. 2.4 Lattices, Complemented lattice, Bounded lattice and Distributive lattice. 2.5 Boolean Functions : Introduction, Boolean variable, Boolean Function of degree n, Boolean identities, Definition of Boolean Algebra. 2.6 Representation of Boolean Functions : Minterm, Maxterm Disjunctive normal form,		
3	January	**Unit 3 : Counting Principles** 3.1 Cardinality of Set : Cardinality of a finite set. 3.2 Basics of Counting : The Product Rule, The Sum Rule, The Inclusion-Exclusion Principle. 3.3 The Pigeonhole Principle: Statement, the Generalized Pigeonhole Principle, Its Applications. 3.4 Generalized Permutations and Combinations : Permutation and 3.5 Combination with Repetitions, Permutations with Indistinguishable Objects	07	12
4	February	**Unit 4: Recurrence Relations** 4.1 Recurrence Relations: Introduction, Formation. 4.2 Linear Recurrence Relations with constant coefficients. 4.3 Homogeneous Solutions. 4.4 Particular Solutions. 4.5 Total Solutions	06	08

for

Prof. .A.R.Rakshe

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class-S.Y.B.SC (Comp.Sci)
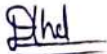
DIV-A

Subject – Data Structure and Algorithm-I

Subject Teacher: Prof.D.R.Kad

Syllabus Completed=100%

Sr.No.	Month	Name Of Topics	Allocated Lectures	Conducted lectures
1	November	**UNIT-1: Introduction to Data Structures and Algorithm Analysis:-** Introduction ,Need of Data Structure , Definitions - Data and information, Data type, Data object, ADT, Data Structure ,Types of Data Structures , Algorithm analysis ,Space and time complexity, Graphical understanding of the relation between different functions of n, examples of linear loop, logarithmic,quadratic loop etc. , Best, Worst, Average case analysis, Asymptotic notations (Big O, Omega Ω,), Problems on time complexity calculation	4	6
2	December	**UNIT 2-Array as a Data Structure:-** ADT of array, Operations, Array applications – Searching, Sequential search, variations - Sentinel search, Probability search, ordered list	10	12

		search, Binary Search, Comparison of searching methods, Sorting Terminology- Internal, External, Stable, In-place Sorting, Comparison Based Sorting - Lower bound on comparison based sorting, Methods- Bubble Sort, Insertion Sort, Selection Sort, Algorithm design strategies - Divide and Conquer strategy, Merge Sort, Quick Sort, complexity analysis of sorting methods.Non Comparison Based Sorting: Counting Sort, Radix Sort, complexity analysis. Comparison of sorting methods			
3	January	**UNIT 3-Linked List:-** List as a Data Structure, differences with array. Dynamic implementation of Linked List, internal and external pointers ,Types of Linked List – Singly, Doubly, Circular , Operations on Linked List - create, traverse, insert, delete, search, sort, reverse, concatenate, merge, time complexity of operations. ,Applications of Linked List – polynomial representation, Addition of two polynomials ,Generalized linked list – concept, representation, multiple-variable polynomial representation using generalized list.,	10		14
4	February	**UNIT 4-Stack:-** Introduction Operations – init(), push(), pop(), isEmpty(), isFull(), peek(), time complexity of operations. Implementation- Static and Dynamic with comparison , Applications of stack . Function call and recursion, String reversal,	6		5

		palindrome checking ,Expression types - infix, prefix and postfix, expression conversion and evaluation (implementation of infix to postfix, evaluation of postfix) ,Backtracking strategy - 4 queens problem (implementation using stack)		
5	February	**UNIT 5-Queue** Introduction Operations - init(), enqueue(), dequeue(), isEmpty(), isFull(), peek(),time complexity of operations, differences with stack. Implementation - Static and Dynamic with comparison Types of Queue - Linear Queue, Circular Queue, Priority Queue, Double Ended Queue (with implementation) Applications – CPU Scheduling in multiprogramming environment, Round robin algorithm .	6	6

Prof. Kad .D.R.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class-S.Y.B.SC (Comp.Sci)   **DIV-A**

Subject – Software Engineering

Subject Teacher: Prof.Virkar P.P.   **Syllabus Completed=100%**

Sr.No.	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	November	**Unit 1:Introduction To Software Engineering and Process Models** Definition of Software, Nature of Software Engineering , Changing nature of software , Software Process, The Process Framework , Umbrella Activities, Process Adaptation, Generic Process Model , Prescriptive Process Models, The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models,The Unified Process	8	7
3	December	**Unit 3: Requirements Analysis** Requirement Elicitation, Software requirement specification (SRS), Developing Use Cases (UML), Building the Analysis Model, Elements of the Analysis Model, Analysis Patterns, Agile Requirements Engineering, Negotiating Requirements, Validating Requirements.	7	6

4	January	Unit 4 : Requirements Modeling Introduction to UML, Structural Modeling, Use case model, Class model, Behavioral Modeling, Sequence model, Activity model Communication or Collaboration model, Architectural Modeling, Component model, Artifact model Deployment model	10	9
5	February	Unit 5 :Design Concepts 5.1 Design Process 5.1.1 Software Quality Guidelines and Attributes Evolution of Software Design Design Concepts, Abstraction Architecture, Patterns, Separation of Concerns, Modularity Information Hiding, Functional Independence , Refinement , Aspects , Refactoring , Object Oriented Design Concepts , Design Classes , Dependency Inversion , Design for Test , The Design Model , Data Design Elements , Architectural Design Elements , Interface Design Elements , Component-Level Diagram , Deployment-Level Diagram	6	5

For
H.P.Loo

Prof. Virkar.P.P.

Class: S.Y.B.Sc. (Computer Science)   **Div:A**

Subject Name- Paper I(ELC 231):Microcontroller Architecture Programming

Subject Teacher- Prof.A.P.Kulkarni   **Syllabus Completed: 100%**

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	October/ November	**UNIT-1:Basics of Microcontroller& Intel 8051 architecture:** Introduction to microcontrollers, Difference in controller and processor, Architecture of 8051, Internal block diagram, Internal RAM organization, SFRS, pin diagram of 8051, I/O port structure & operation, External Memory Interface.	08	13
2	December	**UNIT-2: Programming model of8051** Instruction classification, Instruction set, Addressing Modes: Immediate, register, direct, indirect and relative, assembler directives (ORG, END), features with example, I/O Bit & Byte programming using assembly language for LED and seven segment display (SSD) interfacing. Introduction to8051 programming in C.	12	15

| 3 | January | UNIT 3: Timer / counter, Interrupts :

Timer / counter: TMOD, TCON, SCON, SBUF, PCON Registers, Timer modes, programming for time delay using mode 1 and mode2.
Interrupts: Introduction to interrupt ,Interrupt types and their vector addresses,
Interrupt enable register and interrupt priority register(IE,IP), | 10 | 10 |
| 4 | February | UNIT 4: Interfacing, Serial Communication :

Programming of serial port without Interrupt, Interrupt, Serial Communication: Synchronous and asynchronous serial communication, Use of timer to select baud rate for serial communication.
Interfacing: ADC, DAC, LCD, Stepper motor. | 08 | 06 |

Prof.A.P.Kulkarni

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: S.Y.B.Sc.(Computer Science) **Div:A**

Subject Name- Paper II(ELC 232): Digital Communication & Networking

Subject Teacher- Prof.Dighe A.R. **Syllabus Completed: 100%**

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	December	**UNIT 1: Introduction to Electronic Communication** Introduction to Communication: Elements of Communication system, types of noise sources, Electromagnetic spectrum, signal and channel bandwidth, Types of communication: simplex, half duplex, full duplex, baseband and broadband, Serial communication: asynchronous and synchronous, Information Theory: Information entropy, rate of information (data rate, baud rate), channel capacity, Nyquist theorem, Signal to noise ratio, Noise Figure, Shannon theorem, Error handling codes: Necessity, Hamming code, CRC	09	12
2	January	**UNIT 2: Modulation and Demodulation:** Introduction to modulation and demodulation: Concept and need of modulation and demodulation, Digital Modulation techniques: Pulse Code Modulation (PCM), FSK, QPSK, QAM.	05	05

3	January	UNIT 3: Multiplexing, Spectrum Spreading and Media Access Control Multiplexing techniques: Frequency division multiplexing, wavelength division multiplexing, Time division multiplexing Spread Spectrum techniques: Frequency hopping Spread Spectrum, Direct Sequence Spread Spectrum Media Access Control (MAC): Random Access Protocol: ALOHA, CSMA, CSMA/CD, CSMA/CA, Controlled Access Protocols: Reservation, Polling, Token passing, Channelization Protocols: FDMA, TDMA, CDMA.	12	12
4	February	UNIT 4: Computer Networking Introduction to computer networks Types of networks : LAN, MAN, WAN, Wireless networks, Switching, Internet, Network topology : point to point, Star, Ring, Bus, Mesh, Tree, Daisy Chain, Hybrid Network devices : Repeater, Switch, Networking cables, Router, Bridge, Hub, Brouter, Gateway. Wired LANs:- Ethernet: Ethernet protocol, standard Ethernet, 100 MBPS Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, Computer network model: OSI and TCP/IP.	10	12

Prof.Dighe A.R.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: S.Y.B.Sc. (Computer Science) Div:A

Subject Name- Paper I (MTC-231): Group and Coding Theory

Subject Teacher- Prof. Karle S.N   SyllabusCompleted:100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	November	**Unit 1. Integers** 1.1 Division Algorithm (without Proof) 1.2 G.C.D. using division algorithm and expressing it as linear combination 1.3 Euclid's lemma 1.4 Equivalence relation (revision), Congruence relation on set of integers, Equivalence class partition	05	10
2	November	**Unit 2. Groups** 2.1 Binary Operation 2.2 Group: Definition and Examples 2.3 Elementary Properties of Groups	03	09
3	December	**Unit 3. Finite Groups and Subgroups** 3.1 Order of a group, order of an element 3.2 Examples $(Z_n, +)$ and $(U(n), *)$ 3.3 Subgroup definition, Finite subgroup test, subgroups of Zn 3.4 Generator, cyclic group, finding generators of Zn(Corollary 3,4 without proof) 3.5 Permutation group, definition, composition of two permutations, representation as product of disjoint cycles, inverse	10	12

			and order of a permutation, even/ odd permutation 3.6 Cosets: Definition, Examples and Properties, Lagrange Theorem(without Proof) Error detection		
4	January/ February	Unit 4. Groups and Coding Theory 4.1 Coding of Binary Information and 4.2 Decoding and Error Correction 4.3 Public Key Cryptography	18	20

Prof. Karle S.N

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: S.Y.B.Sc. (Computer Science)   Div:A

Subject Name- Paper II (MTC-232): Numerical Techniques

Subject Teacher- Prof. Udhane R.B.   SyllabusCompleted:100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	December	**Unit 1: Algebraic and Transcendental Equation** 1.1 Introduction to Errors 1.2 False Position Method 1.3 Newton-Raphson Method	04	04
2	December	**Unit 2: Calculus of Finite Differences and Interpolation** 2.1 Differences 2.2. Forward Differences 2.3 Backward Differences 2.4 Central Differences 2.5 Other Differences (δ, μ operators) 2.6 Properties of Operators	08	10
3	January	2.7 Relation between Operators 2.8 Newton's Gregory Formula for Forward Interpolation 2.9 Newton's Gregory Formula for Backward Interpolation 2.10 Lagrange's Interpolation Formula 2.11 Divided Difference 2.12 Newton's Divided Difference Formula	08	10

4	January	**Unit 3: Numerical Integration** 3.1 General Quadrature Formula 3.2 Trapezoidal Rule 3.3 Simpson's one-Third Rule 3.4 Simpson's Three-Eight Rule	08	08
5	February	**Unit 4: Numerical Solution of** **Ordinary Differential Equation** 4.1 Euler's Method 4.2 Euler's Modified Method 4.3 Runge-Kutta Methods	08	10

Prof. Udhane R.B

Head.
Department of Computer Science.
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K.T.S.P.MANDAL'S

HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
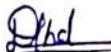## ACADEMIC YEAR-2021-2022 SEM-I

Class-T.Y.B.SC (Comp.Sci)   **DIV-A**

Subject – Operating System-I

Subject Teacher: Prof.Kad. D.R.   **Syllabus Completed=100%**

Sr.No.	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	November	**UNIT-1:Indroduction to Operating Systems:** Introduction of operating system,genarations& evolution of os, types of os,memorymanagement,protection and security,osstructure,microkernel,os module –open source system,process managements system calls,types of system call &working privileged instruction	6	6
2	December	**UNIT-2:Processes and Threads:**processconcepts, process states ,PCB,Process Scheduling-Scheduling queue,Scheduler,ContextSwitch,types of scheduler,operation on process – creation and termination,creation using fork () system call,Threads-Types of threads,benefits of threads,libraries.	6	7

3	December	UNIT -3:Process Scheduling:- Basic Concepts CPU/IO burst cycle,CPUScheduler, schedulingcriteria, dispatcher ,merits &demeritsTypes of Scheduler - preemptive,non-preemtive,Scheduling algorithm-FIFO,SJF,PRIORITY Scheduling,RoundrobinAlgorithm,multiplequeue scheduling,	7	6
4	January	UNIT 5: Memory Managements:- Basic hardware address binding ,logical address,physicaladdress,dynamic address vs static linking,dynamicloading,and sheared libraries,swapping,memorymapping, protection,mft,fragmentation.,contiguous memory alloction,paging,segmentation,segmentaion with paging,VM-,demondpaging,Performance of demand paging,page removal algorithm-FIFO,Optimal,LRU,MFU.	12	11
5	February	UNIT:-4 Sychronization:- Critical Section Problem, semaphore usage,Implementaion, classic Problem of Sychronization-The bounded buffer problem,The Reader writer Problem,The dinning Philosopher Problem.	5	5

Prof. Kad .D.R.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class-T.Y.B.SC (Comp.Sci)   DIV-A

Subject – Course Title :Computer Networks - II
Subject Teacher: Prof. Dighe A.R.   Syllabus completed=100%

Sr. No.	Month	Name Of Topics	Allocated Lecture	Conducted Lectures
1	December	**Unit 1:-Application Layer** Domain Name System Name space-Flat name space, Hierarchical name space Domain Name Space -Label ,Domain name, FQDN,PQDN Distribution of Domain Name Space-Hierarchy of name servers, zone, Root server, Primary and secondary servers. DNS in the Internet: Generic domains, Country domains,inverse domain Resolution-Resolver,mapping names to address,mapping addresses to names,recursiveresolution,iterative resolution,caching Electronic Mail-Architecture-First scenario, second scenario, Third scenario, Fourth scenario User agent-services of user agent, types of UA Format of e-mail MIME-MIME header	10	9

		Message transfer agent-SMTP Message Access Agent: POP and IMAP File Transfer FTP-Communication over data control connection,Filetype,datastructure, Transmissionmode,anonymous FTP		
2	January	**Unit 2:Multimedia** Digitizing audio and video, Audio and Video compressionStreaming Stored audio/video First approach Second approach Third approach Fourth approach Streaming live audio/video Real time interactive audio/video- Characteristics, Time relationship, timestamp, Playback buffer, ordering multicasting, translation RTP-Packet format RTCP-Message types Voice over IP-SIP,SIP session H.323-Architecture, Protocols	8	7
3	January	**Unit 3:-Cryptography and Network Security** Terminology: Cryptography, plain text and cipher text, cipher key, categories of cryptography- Symmetric key, asymmetric key Encryption model Symmetric key cryptography Traditional ciphers – substitution cipher, shift cipher, Transposition cipher Simple Modern ciphers-XOR, Rotation cipher, s-box,p-box	9	8

		Modern round ciphers-DES Mode of operation-ECB,CBC,CFB,OFB Asymmetric key cryptography-RSA Security Services Message confidentiality-With Symmetric key cryptography, with asymmetric key cryptography Message integrity-Document and fingerprint, message and message digest Message authentication-MAC,HMAC Digital signature Entity Authentication-Passwords, Fixed passwords challenge-response		
4	February	**Unit 4:-Security in the Internet** IPSecurity(IPSec) Two modes• Two security protocols• Services provided by IPSec• Security association• Internet key exchange• Virtual private network• SSL/TLS SSL services• Security parameters• Sessions and connections• Four protocols• Transport layer security• PGP Security parameters• Services• PGP algorithms• Key rings• PGP certificates• Firewalls Packet filter firewa•	9	8

Prof. Dighe.A.R.

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class-T.Y.B.SC (Comp.Sci)   DIV-A

Subject – Theoretical Computer Scienc

Subject Teacher- Prof. Pardeshi P.N.   Syllabus completed=100%

Sr.No.	Month	Topic	Allocated lectures	Conducted lectures
1	December	**1 Finite Automaton** 1.1 Introduction: Symbol, Alphabet, String, Prefix & Suffix of Strings, Formal Language, Operations on Languages. 1.2 Deterministic finite Automaton – Definition, DFA as language recognizer, DFA as pattern recognizer. Nondeterministic finite automaton – 1.3 Definition and Examples. NFA To DFA (Myhill Nerode Method) NFA with ε-transitions 1.4 Definition and Examples. NFA with ε-Transitions to DFA & 1.5 Examples Finite automaton with output – Mealy and Moore machine, Definition and 1.6 Examples. Minimization of DFA, Algorithm & Problem using Table Method.	10	16
2	January	2.Regular Expressions and Languages 2.1 Regular Expressions (RE): Definition & Example Regular Expressions Identities. 2.2 Regular language-Definition and 2.3 Examples. Conversion of RE to FA-	6	8

		Examples. Pumping lemma for regular languages and applications. Closure Properties of regular Languages.		
3	January	3. Context-Free Grammars and Languages 3.1 Grammar - Definition and Examples. Derivation-Reduction - Definition and Examples. Chomsky Hierarchy. 3.2 CFG: Definition & Examples. LMD, RMD, Parse Tree Ambiguous Grammar: Concept & Examples. 3.3 Simplification of CFG: Removing Useless Symbols, Unit Production, ϵ-production and Nullable Symbol. 3.4 Normal Forms: Greibach Normal Form (GNF) and Chomsky Normal Form (CNF) 3.5 Regular Grammar: Definition. Left linear and Right Linear Grammar-Definition and Example. 3.6 Equivalence of FA & Regular Grammar Construction of regular grammar equivalent to a given DFA. Construction of a FA from the given right linear grammar	14	17
	February	4.Push Down Automata 4.1 Definition of PDA and examples. Construction of PDA using empty stack and final State method: Examples using stack method. 4.2 Definition DPDA & NPDA, their correlation and Examples of NPDA CFG (in GNF) to PDA: Method and examples	5	4
		5. Turing Machine 5.1 The Turing Machine Model, Definition and Design of TM Problems on language	5	4

		recognizers. 5.2 Language accepted by TM. Types of Turing Machines (Multitrack TM, Two-way TM, Multitape TM, Nondeterministic TM) Introduction to LBA (Basic Model) & CSG. (Without Problems).	

For

Prof. P.N.Pardeshi

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: T.Y.B.Sc. (Computer Science) **Div:A**

Subject Name- Paper I (CS – 354): Foundation Of Data Science

Subject Teacher- Prof. Pardeshi P.N. **Syllabus Completed: 100%**

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	December	**Chapter 1** Introduction to Data Science Introduction to data science, The 3 V's: Volume, Velocity, Variety Why learn Data Science? Applications of Data Science The Data Science Lifecycle Data Scientist's Toolbox Types of Data Structured, semi-structured, Unstructured Data, Problems with unstructured data Data sources Open Data, Social Media Data, Multimodal Data, standard datasets Data Formats Integers, Floats, Text Data, Text Files, Dense Numerical Arrays, Compressed or Archived Data, CSV Files, JSON Files, XML Files, HTML Files , Tar Files, GZip Files, Zip Files, Image Files: Rasterized, Vectorized, and/or Compressed	06	05
2	December	**Chapter 2** Statistical Data Analysis 2.1.Role ofstatistics in data	10	09

		science 2.2.Descriptive statistics Measuring the Frequency Measuring the Central Tendency: Mean, Median, and Mode Measuring the Dispersion: Range, Standard deviation, Variance, Interquartile Range 2.3.Inferentialstatistics Hypothesis testing, Multiple hypothesis testing, Parameter Estimation methods, 2.4.Measuring Data Similarity and Dissimilarity Data Matrix versus Dissimilarity Matrix, Proximity Measures for Nominal Attributes, Proximity Measures for Binary Attributes, Dissimilarity of Numeric Data: Euclidean, Manhattan, and Minkowski distances, Proximity Measures for Ordinal Attributes 2.5.Concept of Outlier, types of outliers, outlier detection methods		
3	January	**Chapter 3** Data Preprocessing Data Objects and Attribute Types: What Is an Attribute?, Nominal , Binary, Ordinal Attributes, Numeric Attributes, Discrete versus Continuous Attributes Data Quality: Why Preprocess the Data? 3.3.Data munging/wrangling operations Cleaning Data - Missing Values, Noisy Data (Duplicate Entries, Multiple Entries for a Single Entity, Missing Entries, NULLs, Huge Outliers, Out☐of☐ Date	10	08

		Data, Artificial Entries, Irregular Spacings, Formatting Issues - Irregular between Different Tables/Columns, Extra Whitespace, Irregular Capitalization, Inconsistent Delimiters, Irregular NULL Format, Invalid Characters, Incompatible Datetimes) Data Transformation – Rescaling, Normalizing, Binarizing, Standardizing,Label and One Hot Encoding Data reduction Data discretization		
4	**February**	**Chapter 4:**Data Visualization Introduction to Exploratory Data Analysis Data visualization and visual encoding Data visualization libraries Basic data visualization tools Histograms, Bar charts/graphs, Scatter plots, Line charts, Area plots, Pie charts, Donut charts Specialized data visualization tools Boxplots, Bubble plots, Heat map, Dendrogram, Venn diagram, Treemap, 3D scatter plots Advanced data visualization tools- Wordclouds Visualization of geospatial data Data Visualization types	10	08

For

Prof. Pardeshi P.N.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

Class: T.Y.B.Sc. (Computer Science)　　Div:A

Subject Name- Paper 1 (CS-355):Object Oriented Programming Using Java -I

Subject Teacher- Prof. Kad.D.R.　　SyllabusCompleted:100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	November	**Chapter 1** An Introduction to Java Object Oriented Programming Concepts A short history of Java Features OR Buzzwords of Java Java Environment Simple Java Program Java Tools – jdb, javap, javadoc Types of Comments Data Types Final Variable Declaring 1D, 2D Array Accepting Input (Command Line Arguments, BufferedReader, Scanner)	06	05
2	December	**Chapter 2** Objects and Classes Defining your own classes Access Specifiers (public, protected, private, default) Array of Objects Constructors, Overloading Constructors and Use of 'this' keyword static block, static fields And methods Predefined Classes Object Class, Methods (equals(), toString(),hashcode(), getClass()) String Class And StringBufferClass,Formatting	07	07

		String data using format() method Creating , Accessing And Using Packages Wrapper Classes		
3	January	**Chapter 3** Inheritance and Interface Inheritance Basics (extends Keyword) and Types of Inheritance Superclass, Subclass and use of Super Keyword Method Overriding and runtime polymorphism Use of final keyword related to method and class Use of abstract class and abstract methods Defining and Implementing Interfaces Runtime polymorphism using interface Concept of Marker and Functional Interfaces	08	07
4	January	**Chapter 4** Exception and File Handling Dealing with errors , Exception class, Checked And Unchecked Exception Catching Exceptions, Multiple Catch Block, Nested try block Creating User Defined Exception Introduction to Files And Streams Input-OutputStream : FileInput/OutputStream, BufferedInput/OutputStream, DataInput/OutputStreamReader-Writer : FileReader/Writer, BufferedReader/Writer, InputStreamReader, OutputStreamWriter	05	04
5	February	**Chapter 5:** User Interface with AWT and Swing What is AWT? What is Swing? Difference between AWT and Swing The MVC Architecture And Swing Layouts And Layout Managers	10	8

		Containers And Components – JFrame, JButton, JLabel, JText, JTextArea, JCheckBox And JRadioButton, JList, JComboBox, JMenu And related Classes Dialogs (Message, Confirmation, Input), JFileChooser, JColorChooser Event Handling: Event Sources, Listeners Adapters And Anonymous Inner Class		

Prof. Kad.D.R.

HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2021-2022 SEM-I

DIV-A

Class-T.Y.B.SC (Comp.Sci)

Subject – Python Programming

Subject Teacher: Prof.Pardeshi P.N.

Syllabus Completed=100%

Sr. No.	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	November	**UNIT-1:Introduction to Python:-**Introduction to Python The Python Programming Language, History, features, Applications, Installing Python, Running Simple Python program Basics of Python Standard data types - basic, none, Boolean (true & False), numbers, Variables, Constants,Python identifiers and reserved words, Lines and indentation, multi-line statements and Comments,Input/output with print and input ,functions Declaration, Operations on Data such as assignment, arithmetic, relational, logical and bitwise operations, dry run, Simple Input and o/p.	3	3

2	December	UNIT 2:-Control Statements:-Sequence Control – Precedence of operators, Type conversion Conditional Statements: if, if-else, nested if-else, Looping- for, while, nested loops, loop controlstatements (break, continue, pass) a. Strings: declaration, manipulation, special operations, escape character, string formatting operator, Raw String, Unicode strings, Built-in String methods.	4	3
3	December	Unit 3:-Lists, functions, tuples and dictionaries, Sets:-Python Lists: Concept, creating and accessing elements, updating & deleting lists, traversing a List, reverse Built-in List Operators, Concatenation, Repetition, In Operator, Built-in List functions and methods. Functions: Definitions and Uses, Function Calls, Type Conversion Functions, Math Functions, Composition, Adding New Functions, Flow of Execution, Parameters and Arguments, Variables and Parameters, Stack Diagrams, Void Functions, Anonymous functions Importing with from, Return Values, Boolean Functions, More Recursion, Functional programming tools - filter(), map(), and	7	7

		reduce(),recursion, lambda forms. Tuples and Dictionaries: Tuples, Accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, and Basic tuples operations, Concatenation, Repetition, in Operator, Iteration, Built-in tuple functions, indexing, slicing and matrices. Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary, Built-In Dictionary Functions, Built-in Dictionary Methods. Sets-Definition, transaction of set(Adding, Union, intersection), working with sets		
4	January	**UNIT:- 4 :-Modules ,Working with file ,Exception Handling:-** **Modules:** Importing module, Creating & exploring modules, Math module, Random module, Time module **Packages:** Importing package, creating package,examples **Working with files:** Creating files and Operations on files	4	4

		(open, close, read, write), File object attributes, file positions, Listing Files in a Directory, Testing File Types, Removing files and directories, copying and renaming files, splitting pathnames, creating and moving directories **Regular Expression-** Concept of regular expression, various types of regular expressions, using match function. **Exception Handling:** Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions.		

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