K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

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

Subject – Advanced 'C' Programming

Subject Teacher: Prof. S.A.Randive   **Syllabus Completed=100%**

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	Feb	UNIT 1: Pointers :- Introduction to Pointers. Declaration, definition, initialization, dereferencing. Pointer arithmetic. . Relationship between Arrays & Pointers- Pointer to array, Array of pointers. . Multiple indirection (pointer to pointer). . Functions and pointers- Passing pointer to function, Returning pointer from function, Function pointer. . Dynamic memory management- Allocation(malloc(),calloc()), Resizing(realloc()), Releasing(free())., . Memory leak, dangling pointers. Types of pointers.	08	06
2	March	UNIT 2: Strings :- String Literals, string variables, declaration, definition, initialization. Syntax and use of predefined string functions Array of strings. Strings and Pointers Command line arguments.	06	05
3	March	UNIT 3: Structures And Unions. :- Concept of structure, definition and initialization, use of typedef. Accessing structure members. . Nested Structures . Arrays of Structures. Structures and functions- Passing each member of structure as a separate argument, Passing structure by value / address. . Pointers and structures. Concept of Union, declaration, definition, accessing union members. Difference between structures and union	08	08

4	April	**UNIT 4- File Handling** : . Introduction to streams. . Types of files. . Operations on text files. . Standard library input/output functions. . Random access to files.	06	05
5	April	**UNIT 5: Preprocessor :-** Role of Preprocessor . Format of preprocessor directive . File inclusion directives (#include) . Macro substitution directive, argumented and nested macro . Macros versus functions	02	02

Prof.S.A.Randive

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar, (Pune) - 410 505.

Class-F.Y.B.SC (Comp.Sci)   **DIV-A**
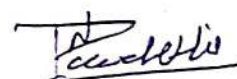
Subject – Relational Database Management Systems

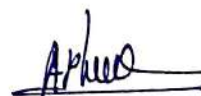**Subject Teacher: Prof.P.N.Pardeshi**   **Syllabus Completed=100%**

Sr.No.	Month	Name ofTopics	Allocated Lectures	Conducted lectures
1	Feb-March	**UNIT 1: Relational Database Design Using PLSQL** Introduction to PLSQL PL/PgSqL: Datatypes, Language structure. Controlling the program flow, conditional statements, loops. Stored Procedures. Stored Functions. Handling Errors and Exceptions. Cursors. Trigger	08	09
2	March-April	**UNIT 2: Transaction Concepts and concurrency control**: Describe a transaction, properties of transaction, state of the transaction. Executing transactions concurrently associated problem in concurrent execution. Schedules, types of schedules, concept of Serializability, Precedence graph for Serializability. Ensuring Serializability by locks, different lock modes, 2PL and its variations. Basic timestamp method for concurrency, Thomas Write Rule. Locks with multiple granularities, dynamic database concurrency (Phantom Problem). Timestamps versus locking. Deadlock and deadlock handling - Deadlock Avoidance (wait-die, wound-wait), Deadlock Detection and Recovery (Wait for graph). .	10	11
3	April	**UNIT 3: Database Integrity and Security Concepts:-** Domain constraints Referential Integrity Introduction to database security concepts Methods for database security .1Discretionary access control method .2Mandatory access	06	06

		control. Role base access control for multilevel security. Use of views in security enforcement. Overview of encryption technique for security. Statistical database security.		
4	April-May	**UNIT 4- Crash Recovery:** Failure classification Recovery concepts. Log base recovery techniques (Deferred and Immediate update) Checkpoints, Relationship between database manager and buffer cache. Aries recovery algorithm. Recovery with concurrent transactions (Rollback, checkpoints, commit) Database backup and recovery from catastrophic failure.	04	05
5	May	**UNIT 5: Other Databases:-** Introduction to Parallel and distributed Databases . Introduction to Object Based Databases. XML Databases. NoSQL Database. Multimedia Databases. Big Data Databases	04	04

Prof.P.N.Pardeshi

Head,
Department of Computer Science.
Hutatma Rajguru Mahavidyalaya
Rajgurunagar, (Pune) - 410 505.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
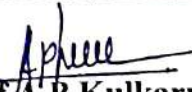## ACADEMIC YEAR-2022-2023 (SEM-II)

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

Subject – ELC 121: Instrumentation Systems

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

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	April	**Unit 1: Introduction to Instrumentation System** : Block diagram of Instrumentation system, Definition of sensor, transducer and Actuators, Classification of sensors: Active and passive sensors. Specifications of sensors: Accuracy, range, linearity, sensitivity, resolution, reproducibility.	08	08
2	April	**Unit 2: Sensors and Actuators** :Temperature sensor (Thermistor, LM-35), optical sensor (LDR), Passive Infrared sensor (PIR), Tilt Sensor, ultrasonic sensor, Motion sensor, Image Sensor, Actuators: DC Motor, stepper motor	10	10
3	May	**Unit 3: Smart Instrumentation System and Smart Sensors**: Block diagram of Smart Instrumentation system, Concept of smart sensor, Film sensors, Nano sensor	06	06
4	May	**Unit 4: OPAMP as signal Conditioner** :Concept, block diagram of Op amp, basic parameters (ideal and practical): input and output impedance, bandwidth, differential and common mode gain, CMRR, slew rate, IC741/ LM324, Concept of virtual ground, Op amp as inverting and non inverting amplifier, Unity gain follower, Opamp as adder, substractor, Op amp as current to voltage and voltage to current convertor, Voltage to frequency converter, Op amp as comparator, Problems based on above Op Amp applications.	12	12

Prof.A.P.Kulkarni
Head,
Department of Computer Science.
Hutatma Rajguru Mahavidyalaya
Rajgurunagar. (Pune) - 410 505.

DIV-A

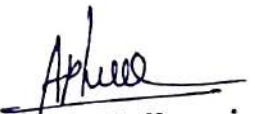**Class-F.Y.B.SC (Comp.Sci)**

Subject – ELC 122 : Basics of Computer Organisation

Subject Teacher: Prof.A.P.Kulkarni   SyllabusCompleted=100%

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	Feb	**Unit 1: Flip-flops** : RS Flip Flop using NAND gate, clocked RS Flip Flop, D Latch, J K Flip Flop,T Flip Flo .	05	05
2	March	**Unit 2: Shift registers and Counters** :Shift registers - SISO, SIPO, PISO, PIPO shift registers, Ring Counter using D Flip flop. Counters -Synchronous and Asynchronous type, 3-bit Up, Down and Up-Down counter, Concept of modulus Counters (Timing Diagram of all above are expected)	09	09
3	March/ April	**Unit 3: Basics of Computer System** :Basic Computer Organization, Concept of Address Bus, Data Bus, Control Bus. CPU Block Diagram and Explanation of each block, Register based CPU organization, Concept of Stack & its organization, I/O organization: need of interface, block diagram of general I/O interface	12	12
4	April	**Unit 4: Memory Organization** : Memory Architecture, Memory hierarchy, Types of Memories, Data Read/ Write process, Vertical and Horizontal Memory Expansion, Role of Cache memory, Virtual Memory	10	10

Prof.A.P.Kulkarni
Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar, (Pune) - 410 505.

K.T.S.P.MANDAL'S

HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 SEM-II

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

Subject – Data Structure and Algorithm-II

Subject Teacher: Prof.Y.J.Patangade   **Syllabus Completed=100%**

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	February	**UNIT-1: Tree:-** Concept and Terminologies .Types of Binary trees - Binary tree, skewed tree, strictly binary tree, full binary tree, complete binary tree, expression tree, binary search tree, Heap . Representation – Static and Dynamic . Implementation and Operations on Binary Search Tree - Create, Insert, Delete, Search, Tree traversals– preorder, inorder, postorder (recursive implementation), Level-order traversal using queue, Counting leaf, non-leaf and total nodes, Copy, Mirror. Applications of trees.1 Heap sort, implementation .2 Introduction to Greedy strategy, Huffman encoding (implementation using priority queue	10	10
2	February-March	**UNIT 3-Graph :-**Concept and terminologies Graph Representation –Adjacency matrix, Adjacency list, Inverse Adjacency list, Adjacency multilist Graph Traversals – Breadth First Search and Depth First Search (with implementation) .Applications of graph CBCS: Topological sorting Use of Greedy Strategy in Minimal Spanning Trees (Prims and	12	12

		Kruskals algorithm) Single source shortest path - Dijkstra's algorithm 3. Dynamic programming strategy, All pairs shortest path - Floyd Warshall algorithm 3. Use of graphs in social networks		
3	March-April	**UNIT 2-Efficient Search Trees:** - Terminology: Balanced trees - AVL Trees, Red Black tree, splay tree, Lexical search tree -Trie AVL Tree- concept and rotations Red Black trees - concept, insertion and deletion. Multi-way search tree - B and B+ tree - Insertion, Deletion	8	8
4	May	**UNIT 4-Hash Table:-**Concept of hashing Terminologies – Hash table,Hash function, Bucket, Hash address, collision, synonym, overflow etc. Properties of good hash function Hash functions : division function, MID square , folding methods Collision resolution techniques.1 Open Addressing - Linear probing, quadratic probing, rehashing.2 Chaining - Coalesced , separate chaining	6	7

Prof. Y.J.Patangade

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar, (Pune) - 410 505.

K.T.S.P.MANDAL'S

HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 SEM-II

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

Subject – Computer Networks-I

Subject Teacher: Prof. S.A.Randive   Syllabus Completed=100%

Sr. No.	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	April	**Unit 1:Introduction to Networks and Network Models** 1.Data communication, components, data representation . Networks, network criteria, network types - LAN, WAN, Switching, The Internet, Accessing the Internet . Network Software- Protocol hierarchies, Design Issues of the layer, Connection Oriented and Connectionless Services, . Reference models - OSI Reference Models, TCP/IP Reference model, Connection devices in different layers, Comparison of OSI and TCP/IP Reference Models.	8	7
2	April	**UNIT 2:Lower Layers** :- Communication at the physical layer, data rate limits - Noiseless channel (Nyquist bit rate), noisy channel (Shannon capacity), Performance - bandwidth, throughput, latency, bandwidth-delay product, jitter .Design issues of Data Link Layer, Services - Framing, flow control, error control, congestion control, Link layer addressing Framing Methods - Character Count, Flag bytes with Byte Stuffing, Flags bits with Bit Stuffing, Physical Layer Coding Violations The Channel allocation problem, Static and dynamic allocation, Media Access Methods - Taxonomy of multiple-access protocols Switching and TCP/IP layers, Types - circuit switching, packet switching and message switching Wired LANs - Standard Ethernet characteristics, Addressing, Access method,	10	10

		implementation, Fast and Gigabit Ethernet Wireless LANs - Architectural comparison, Characteristics, Access control, IEEE 802.11 CBCSarchitecture, Physical layer, MAC sublayer, Bluetooth architecture, Layers.		
3	May	**Unit 3 : Network Layer** Network layer services - Packetizing, Routing and forwarding, other services Open and closed loop congestion control IPv4 addressing- Address space, classful addressing, Subnetting, Supernetting, classless addressing, Network address resolution (NAT) Forwarding of IP packets- based on destination address, based on label Network Layer Protocols- Internet Protocol (IP), IPv4 datagram format, Fragmentation, options Mobile IP-addressing, agents, Three phases Next Generation IP- IPv6 address representation, address space, address types, IPv6 protocol, packet format, extension header, Difference between IPv4 and IPv6 Routing - General idea, Algorithms - Distance vector routing, link state routing, pathvector routing	12	10
4	May	**Unit 4 : Transport Layer** Transport layer Services- Process-to-process communication, Addressing, Encapsulation and decapsulation, Multiplexing and demultiplexing, Flow control, Pushing or pulling, Flow control, Buffers, Sequence numbers, Acknowledgements, sliding window, congestion control Connectionless and Connection-oriented service, Port numbers Transport layer protocols- User datagram protocol, user datagram, UDP services Transmission Control Protocol - TCP Services, TCP Features, TCP Segment format, three-way handshake for connection establishment and termination, State transition diagram, windows in TCP.	10	07

Prof. S.A.Randive

Head,
Department of Computer Science.
Hutatma Rajguru Mahavidyalaya
Rajgurunagar. (Pune) - 410 505.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 SEM-II

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

Subject Name- Paper I MTC-241: Computational Geometry

Subject Teacher- Prof. J.B.Arude   **SyllabusCompleted:100%**

Sr. No	Month	Name of Topic	Allocated Lectures	Conducted Lectures
1	March	**Unit 1. Two dimensional transformations:** Introduction. Representation of points. Transformations and matrices. Transformation of points. Transformation of straight lines Midpoint Transformation Transformation of parallel lines Transformation of intersecting lines Transformation: rotations, reflections, scaling, shearing. Combined transformations. Transformation of a unit square. Solid body transformations. Translations and homogeneous coordinates.Rotation about an arbitrary point. Reflection through an arbitrary line.	12	10
2	April	**Unit 2. Three dimensional transformations:** Introduction. Three dimensional – Scaling, shearing, rotation, reflection, translation. Multiple transformations. Rotation about – an axis parallel to coordinate axes, an arbitrary line Reflection through – coordinate planes, planes parallel to coordinate planes , an arbitrary plane	08	10
4	April	**Unit 3. Projection :**Orthographic projections. Axonometric projections. Oblique projections . Single point perspective projection	08	08
5	May	**Unit 4. Plane and space Curves:** Introduction. Curve representation. Parametric curves. Parametric representation of a circle and generation of circle. 4 Bezier Curves – Introduction, definition, properties (without proof), Curve fitting (up to n = 3), equation of the curve in matrix form (upto n = 3)	08	08

Prof. J.B.Arude

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar, (Pune) - 410 505.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

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

Div:A

Subject Name- Paper II MTC-242: Operations Research

Subject Teacher- Prof. A.R.Rakshe

Syllabus Completed:100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	March	**Unit 1: Linear Programming Problem I** Introduction Definition and Examples Problem solving using Graphical method Theory of Linear Programming, Slack and surplus variables, Standard form of LPP, Some important definitions, Assumptions in LPP, Limitations of Linear programming, Applications of Linear programming, Advantages of Linear programming Techniques . Simplex method, Big- M-method	12	10
2	April	**Unit 2: Linear Programming Problem II** Special cases of LPP : Alternative solution, Unbounded solution, Infeasible solution Duality in Linear Programming, Primal to dual conversion, Examples	08	10
4	April	**Unit 3: Assignment Models** Assignmment Model -Introduction Hungerian method for Assignment problem	06	06
5	May	**Unit 4: Transportation Models** Introduction, Tabular representation Methods of IBFS (North-West rule, Matrix-minima, Vogel's Approximation), Algorithms The Optimality Test of Transportation Model (MODI method only)	10	10

Prof.A.R.Rakshe

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar. (Pune) - 410 505.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

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

Div:A

Subject Name- Embedded System Design (ELC-241)

Subject Teacher- Prof. Y.J.Patangde

Syllabus Completed: 100%

Sr. No	Month	Name of Topic	Allocated Lectures	Conducted Lectures
1	March	UNIT-1: Introduction to Embedded systems using single board computers (SBC):- Single boards computer block diagram, types, Comparison of SBC models, Specifications, I/O devices (Storage, display, keyboard and mouse), Network access devices.	08	08
2	March	Unit 2: Architecture of System on Chip (SOC):- Architecture of SoC, Basic version Broad Coprocessor, Pin Description of Raspberry Pi, Architectural features: CPU Overview, CPU Pipeline stages, CPU Cache Organization, Branch Prediction & Folding (Concept), GPU Overview	08	10
3	April	Unit 3:Programming using Python:- Overview of Rasberian OS (Operating System), Installation, different types of Operating Systems Basic Python Programming (Script programming):Variable & data types, Flow Control structures, Conditional statements (If…Then…else), Functions: I/O function (GPIO, Digital),Time functions, Library functions Basic Arithmetic Programs: Addition, Subtraction, Multiplication, Division	10	10
4	May	Unit 4 : Interfacing of devices using Python Programming : Basic interfacing: LED, Switch, LCD Internal Advanced: Bluetooth, Wifi, Ethernet, External advanced: Camera, Serial Communication GSM, Ultrasonic Sensor, PIR, Finger Print reader.	10	10

Prof.Y.J.Patangade

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar, (Pune) - 410 505.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

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

Subject Name- Wireless Communication and Internet of Things (ELC242)

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

Sr. No	Month	Name of Topic	Allocated Lectures	Conducted Lectures
1	February	**Unit1: Wireless Communication: Cellular Telephony :-** Overview of wireless communication, Introduction of cellular telephony system: Frequency reuse, handoff strategies, Co-channel and adjacent channel interference, block diagram of mobile handset Overview of Cellular Telephony generations: 1G to 5G,3G (W-CDMA, UMTS), 4G(LTE) GSM: architecture, frame structure, mobility management, GPRS : architecture, application	12	14
2	March	**Unit 2 : Short Range Wireless Technologies and Location Tracking:** Short range Technologies : Bluetooth: Bluetooth architecture, Bluetooth protocol stack, Bluetooth frame structure Zigbee: Architecture, topologies, applications, Z wave: Protocol architecture, applications RFID: working of RFID system, types of RFID tags, RFID frequencies, applications Location Tracking: GPS system: components of GPS system (space segment, control segment, user segment), GPS receiver, Applications	12	15
3	April	**Unit 3: IoT Architecture** Introduction to IOT : Evolution of IOT, M2M and/or IOT, Seven layer architecture of IoT, Role of cloud in IoT, cloud topologies, Cloud access,	08	10

		Protocols in IoT, Cross connectivity across IoT system components: Device to Gateway-short range Wireless: cellphone as gateway, dedicated wireless• Access points Gateway to cloud: Long range connectivity, (wired, cellular, Satellite, WAN)• Direct Device to Cloud connectivity ,• Networking technologies: Low power local area networking (LPLAN), Low power wide area networking (LPWAN) technologies, comparison of LoRa, sigfox NB-IoT, Cat –M.		
4	May	**Unit 4: IoT Applications** 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.	04	05

Prof.A.P.Kulkarni

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar, (Pune) - 410 505.

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

DIV-A

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

Subject – Operating Systems-II

Subject Teacher: Prof.Y.J.Patangade

Syllabus Completed=100%

Sr.No.	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	February	UNIT-1: Process Deadlocks:- System model Deadlock Characterization – Necessary conditions, Resource allocation graph Deadlock Methods- Prevention and Deadlock Avoidance - Safe state, Resource allocation graph algorithm, Banker's Algorithm Deadlock Detection Recovery from Deadlock – Process termination, Resource preemption File system Management	07	07
2	February	UNIT 2- File system Management :- File concept , File attributes, File operations Access Methods – Sequential, Direct, Other access methods Directory overview, Single level directory, Two level directory, Tree structure.directory, Acyclic graph directory, General graph directory Allocation Methods – Contiguous allocation, Linked allocation, Indexed allocation.Free Space Management – Bit vector, Linked list, Grouping, Counting, Space maps	06	06
3	March	UNIT 3- Disk scheduling :- Overview, Disk Structure Disk Scheduling, FCFS Scheduling, SSTF Scheduling, Scan Scheduling-Scan Scheduling, Look Scheduling , Disk Management	04	04
4	March/ April	UNIT 4- Introduction to Distributed operating systems & Architecture :- What is a distributed system, Design goals Types of distributed systems Architectural styles : Layered architectures , Object-based	11	11

		architectures, Resourcecentered architectures.System architecture – Centralized organization, Decentralized organizations, peer-topeer systems, Hybrid architectures. Example architectures : Network file system(NFS), Web-based distributed systems		
5	April / May	**Unit 5:Mobile Operating Systems** Introduction Features Special Constraints and Requirements of Mobile Operating System Special Service Requirements ARM & Intel architectures – Power management Mobile OS architectures – Underlying OS, kernel structure & native level programming, Runtime issues, Approaches to power management Commercial Mobile Operating Systems - Windows Mobile, iPhone OS (iOS), Android A Comparative Study of Mobile Operating Systems (Palm OS, Android, Symbian OS, Blackberry OS, Apple iOS)	07	07

Prof-Y.J.Patangade

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

Subject – Software Testing

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

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	April	**UNIT-1: Introduction to Software Testing** :Basics of Software Testing – faults, errors and failures Testing objectives Principles of testing Testing and debugging Testing metrics and measurements Verification and Validation Testing Life Cycle	05	08
2	April	**UNIT 2- Software Testing Strategies & Techniques** :Testability - Characteristics lead to testable software. Test characteristics Test Case Design for Desktop, Mobile, Web application using Excel White Box Testing - Basis path testing, Control Structure Testing. Black Box Testing- Boundary Value Analysis, Equivalence partitioning. Differences between BBT & WBT	10	10
3	May	**UNIT 3- Levels of Testing:** A Strategic Approach to Software Testing Test strategies for conventional Software Unit testing Integration testing – Top-Down, Bottom-up integration System Testing – Acceptance, performance, regression, Load/Stress testing, Security testing, Internationalization testing. Alpha, Beta Testing Usability and accessibility testing Configuration, compatibility testing	10	10
4	May	**UNIT 4-** Testing **Web Applications**: Dimension of Quality, Error within a WebApp Environment Testing Strategy for WebApp Test Planning The Testing Process –an overview	06	06
5	May	**Unit 5: Agile Testing** :Agile Testing, Difference between Traditional and Agile testing, Agile principles and values, Agile Testing Quadrants, Automated Tests.	05	07

(Virkar. P.P)

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

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

Subject – Software Testing Tools

Subject Teacher: Prof.Y.J.Patangade **Syllabus Completed=100%**

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	February	**UNIT 1:Introduction to Test case design** :-How to identify errors, bugs in the given application. Design entry and exit criteria for test case, design test cases in excel. Describe feature of a testing method used. .	04	04
2	March	**UNIT 2- Test cases for simple programs** : Write simple programs make use of loops and controlstructures. Write Test Cases for above programs.	04	04
3	March/ April	**UNIT 3- Test cases and Test plan** : Write Test Plan for given application with resources required. Write Test case for given application. Prepare Test report for test cases executed	04	04
4	April	**UNIT 4- Defect Report :** Defect Life Cycle Classification of Defect Write Defect Report	03	03
5	May	**Unit 5:** Testing Tools : How to make use of Automation Tools Types of Testing Tools	03	03
6	April/May	**Demontration:-** Assignments	18	19

Prof.Y.J.Patangade

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

DIV-A

Subject – Compiler Construction

Subject Teacher: Prof.P.N.Pardeshi

Syllabus Completed=100%

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	February	**UNIT 1:Introduction** :- Definition of Compiler, Aspects of compilation. The structure of Compiler. Phases of Compiler – Lexical Analysis, Syntax Analysis, Semantic Analysis, Intermediate Code generation, code optimization, code generation. Error Handling. Introduction to one pass & Multipass compilers, cross compiler, Bootstrapping	04	04
2	February-March	**UNIT 2: Lexical Analysis (Scanner):** Review of Finite automata as a lexical analyzer, Applications of Regular Expressions and Finite Automata (lexical analyzer, searching using RE), Input buffering, Recognition of tokens. LEX: A Lexical analyzer generator (Simple Lex Program)	04	04
3	March	**UNIT 3- Syntax Analysis (Parser):** Definition, Types of Parsers Top-Down Parser – Top-Down Parsing with Backtracking: Method & Problems Drawbacks of Top-Down parsing with backtracking, 3.2.3Elimination of Left Recursion (direct & indirect) 3.2.4Need for Left Factoring & examples Recursive Descent Parsing: Definition Implementation of Recursive Descent Parser Using Recursive Procedures 3.4 Predictive [LL (1)] Parser (Definition, Model) 3.4.1Implementation of Predictive Parser [LL (1)] . FIRST & FOLLOW Construction of LL (1) Parsing Table Parsing of a String using LL (1) Table. Bottom-Up Parsers Operator Precedence Parser -Basic Concepts Operator Precedence	14	15

		Relations form Associativity & Precedence Operator Precedence Grammar Algorithm for LEADING & TRAILING (with ex.) Algorithm for Operator Precedence Parsing (with ex.) Precedence Functions Shift Reduce Parser Reduction, Handle, Handle Pruning Stack Implementation of Shift Reduce Parser (with examples) LR Parser: Model, Types [SLR (1), Canonical LR, LALR]-Method & examples. YACC (from Book 3) –program sections, simple YACC program for expression evaluation		
4	April	**UNIT 4- Syntax Directed Definition:** Syntax Directed Definitions (SDD) Inherited & Synthesized Attributes Evaluating an SDD at the nodes of a Parse Tree, Example Evaluation Orders for SDD's Dependency Graph Ordering the Evaluation of Attributes S-Attributed Definition L-Attributed Definition Application of SDT Construction of syntax trees, The Structure of a Type 4. 4 Translation Schemes 4.4.1 Definition, Postfix Translation Scheme	07	07
5	April	**Unit 5: Code Generation and Optimization:** Compilation of expression – Concepts of operand descriptors and register descriptors with example. Intermediate code for expressions – postfix notations, Triples, Quadruples and Expression trees. Code Optimization – Optimizing transformations – compile time evaluation, elimination of common sub expressions, dead code elimination, frequency reduction, strength reduction. Three address code DAG for Three address code The Value-number method for constructing DAG's. Definition of basic block, Basic blocks, and flow graphs Directed acyclic graph (DAG) representation of basic block. Issues in design of code generator	07	07

Prof. P.N.Pardeshi

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

Subject – Object Oriented Programming using Java – II

Subject Teacher: Prof.S.A.Randive   **Syllabus Completed=100%**

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	February	UNIT-1: Collections:- Introduction to the Collection framework List - ArrayList, LinkedList Set - HashSet, TreeSet, Map - HashMap and TreeMap Interfaces such as Comparator, Iterator, ListIterator, Enumeration	07	07
2	February-March	UNIT 2- Multithreading:- What are threads? Life cycle of thread Creating threads - Thread class , Runnable interface Thread priorities Running multiple threads Synchronization and interthread communication	06	06
3	March	UNIT 3 :Database Programming:- The design of jdbc Types of drivers Executing sql statements, query execution Scrollable and updatable Resultset	06	06
4	April	UNIT 4- Servlets and JSP:- Introduction to Servlet and Hierarchy of Servlet Life cycle of servlet Handing get and post request (HTTP) Handling data from HTML to servlet Retrieving data from database to servlet Session tracking – User Authorization, URL rewriting, Hidden form fields,Cookies and HttpSession Introduction to JSP, Life cycle of JSP Implicit Objects Scripting	12	10

		elements - Declarations, Expressions, Scriplets, Comments JSP Directives - Page Directive, include directive Mixing Scriplets and HTML JSP Actions - jsp:forward , jsp:include, jsp:useBean, jsp:setProperty and jsp:getProperty		
5	April	**Unit 5: Spring Framework** Introduction of Spring framework Spring Modules / Architecture Spring Applications Spring MVC Spring MVC Forms, Validation	06	04

Prof.S.A.Randive

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

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

Subject – Data Analytics

Subject Teacher: Prof.S.A.Randive   **Syllabus Completed=100%**

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	Feb	**UNIT 1: Introduction to Data Analytics :-** Concept of data analytics Data analysis vs Data analytics Types of analytics Diagnostic Analytics, Predictive Analytics , Prescriptive Analytics, Exploratory Analysis, Mechanistic Analysis Mathematical models - Concept Model evaluation: metrics for evaluating classifiers - Class imbalance - AUC, ROC (Receiver-Operator Characteristic) curves, Evaluating value prediction model	06	05
2	March	**UNIT 2: Machine Learning Overview** :Introduction to Machine Learning, deep learning, Artificial intelligence Applications for machine learning in data science The modeling process Engineering features and selecting a model, Training the model, Validating the model, Predicting new observations Types of machine learning Supervised learning, Unsupervised learning, Semi-supervised learning, ensemble techniques Regression models 2.6. Concept of classification, clustering and reinforcement learning.	06	05
3	April	**UNIT 3: Mining Frequent Patterns, Associations, and Correlations :** What kind of patterns can be mined Class/Concept Description: Characterization and Discrimination, Mining Frequent Patterns, Associations, and Correlations, Classification and Regression for Predictive Analysis, Cluster Analysis, Outlier Analysis Mining	12	12

		frequent patterns - Market Basket Analysis. Frequent Itemsets, Closed Itemsets, and Association Rules Frequent Itemset Mining Methods Apriori Algorithm Generating Association Rules from Frequent Itemsets Improving efficiency of apriori algorithm Frequent pattern growth (FP-growth) algorithm		
4	April	**UNIT 4- Social Media and Text Analytics :** Overview of social media analytics Social Media Analytics Process, Seven layers of social media analytics, accessing social media data Key social media analytics methods Social network analysis Link prediction, Community detection, Influence maximization, Expert finding, Prediction of trust and distrust among individuals Introduction to Natural Language Processing Text Analytics : Tokenization, Bag of words, Word weighting : TF-IDF, n-Grams, stop words, Stemming and lemmatization, synonyms and parts of speech tagging Sentiment Analysis Document or text summarization Trend analytics Challenges to social media analytics	12	11

Prof. S.A.Randive

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHAVIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2022-2023 (SEM-II)

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

Subject – Web Technologies - II

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

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	Feb	**UNIT 1: Introduction to Web Techniques**:- Variables Server information Processing forms Setting response headers Maintaining state PHP error handling	06	06
2	Feb-March	**UNIT 2: XML** :-What is XML? XML document Structure PHP and XML XML parser The document object model The simple XML extension Changing a value with simple XML.	06	06
3	March	**UNIT 3: Java Script and Jquery:-** Overview of JavaScript Object Orientation and JavaScript Basic Syntax(JS datatypes, JS variables) Primitives, Operations and Expressions Screen Output and keyboard input(Verification and Validation) JS Control statements and JS Functions JavaScript HTML DOM Events(onmouseup, onmousedown, onclick, onload, onmouseover, onmouseout). JS Strings and JS String methods JS popup boxes(alert, confirm, prompt). Jquery library , Including jquery library in page Jquery selector , DOM manipulation using jquery	10	12

4	April	UNIT 4- Ajax:Introduction of AJAX, AJAX web application model AJAX –PHP framework Performing AJAX validation Handling XML data using php and AJAX Connecting database using php and AJAX.	06	05
5	April	UNIT 5:PHP framework CodeIgniter:- CodeIgniter - Overview, Installing CodeIgnite Application Architecture MVC Framework , Basic concept of CodeIgniter, Libraries Working with databases Load external JS and CSS page & redirecting from controller , Adding JS and CSS , Page redirection. Loading dynamic data on page & session management, cookies management	08	09

Prof.   P.P.Virakar

Head,
Department of Computer Science,
Hutatma Rajguru Mahavidyalaya
Rajgurunagar. (Pune) - 410 505.