

K.T.S.P.MANDAL'S
HUTATMA RAJGURU MAHA VIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 (SEM-II)

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

DIV-A + B

Subject - Advanced 'C' Programming

Subject Teacher: Prof. M.R.Ugle

Syllabus Completed=100%

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted Lectures
1	JAN	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	07
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	06
3	FEB	UNIT 3: Structures And Union: 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	07

4	FEB	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	MARCH	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	03

prof. M. R. Ugle

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-II

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

Div:A+B


Subject Name:-Relational Database Management System

Teacher :-Prof.Patangade Y.J.

Syllabus completed=100%

Sr.no	Month	Name Of Topics	Conducted Lectures
1	December	UNIT_1:-Relational Database Design Using PLSQL Introduction to PLSQL PL/PgSQL: Datatypes, Language structureControlling the program flow, conditional statements, loops,Stored Procedures,Stored Functions,Handling Errors and Exceptions,Cursors,Triggers	8
2	Dec-Jan	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 it variations.Basic timestamp method for concurrency, Thomas Write Rule.Lock with multiple granularity, dynamic database concurrency (Phantom Problem).Timestamps versus locking.Deadlock and deadlock handling - Deadlock Avoidance(wait-die, wound-wait), DeadlockDetection and Recovery (Wait for graph).	10

3	January	Unit 3:-Database Integrity and Security Concepts:- Domain constraints,Referential Integrity Introduction to database security conceptsMethods for database securityDiscretionary access control method,Mandatory access controlRole base access control for multilevel security Use of views in security enforcement.Overview of encryption technique for security. Statistical database security.	6
3	January-february	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 recoveryalgorithm. Recovery with concurrent transactions (Rollback, checkpoints, commit) Database backup and recovery from catastrophic failure	5
4	February-March	Unit 5:-Other Databases Introduction to Parallel and distributed Databases Introduction to Object Based Databases,XML Databases,NoSQL Database Multimedia Databases Big Data Databases	9


 Prof.Patangade Y.J.

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024(SEM-II)

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

DIV-A+B

Subject – ELC 122 : Basics of Computer Organisation

Subject Teacher: Prof.A.P.Kulkarni

Syllabus Completed=100%

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted lectures
1	December	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	January	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	February	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	March	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

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024(SEM-II)

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

DIV-A+B

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	Decmber	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	January	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	February	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	March	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, subtractor, 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	15



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ACADEMIC YEAR-2023-2024 SEM-II

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

DIV-A and B

Subject – Method of applied statistics

Subject Teacher: Prof.N.P.Dhumal .

Syllabus Completed=100%

Sr.No	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	December	UNIT 1:Correlation (For ungrouped data) 1.1 Concept of bivariate data, scatter diagram, its interpretation, concept of correlation, Positive correlation, negative correlation, zero correlation. 1.2 Karl Pearson's coefficient of correlation, properties of correlation coefficient, Interpretation of correlation coefficient, coefficient of determination with interpretation. 1.3 Spearman's rank correlation coefficient (formula with and without ties). 1.4 Numerical problems	10	8
2	Jan-Feb	UNIT 2: Regression (for ungrouped data) 2.1 Concept of linear and nonlinear regression.	12	21

		2.2 Illustrations, appropriate situations for regression and correlation 2.3 Linear regression: Fitting of both lines of regression using least square method. 2.4 Concept of regression coefficients. 2.5 Properties of regression coefficients 2.6 Nonlinear regression models: Second degree curve, exponential curves 2.7 Numerical problems related to real life situations		
3	Feb- Mar	UNIT3: Time series 3.1 Meaning and utility 3.2 Components of time series 3.3 Additive and multiplicative models 3.4 Methods of estimating trend: moving average method, least squares method and exponential smoothing method(with graph and interpretation). 3.5 Numerical problems related to real life situations	8	8
4	March	UNIT4 : Multiple Regression and Multiple, partial Correlation (For Trivariate Data) 4.1 Concept of multiple regressions, Yule's Notations. 4.2 Fitting of multiple regression planes.[Derivation of equation to the plane of regression of X_1 on X_2 and X_3 is expected. Remaining two equations to be written analogously.]	10	8

		<p>4.3 Concept of partial regression coefficients, interpretations.</p> <p>4.4 Concept of multiple correlation: Definition of multiple correlation coefficient and its formula..</p> <p>Concept of partial correlation. Definition of partial correlation coefficient and its formula</p>		
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Prof. Dhumal.N.P.

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ACADEMIC YEAR-2023-2024 SEM-II

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

DIV-A and B

Subject – Continuous probability distribution and testing of hypothesis

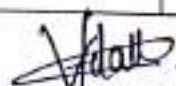
Subject Teacher: Prof.S.D.Adak.

Syllabus Completed=100%

Sr.No.	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	Dec-Jan	UNIT 1:Standard Continuous Probability Distributions 1.1 Uniform Distribution: statement of p.d.f., mean, variance, nature of probability curve. Theorem (without proof): The distribution function of any continuous r.v. if it is invertible follows $U(0, 1)$ distribution 1.2 Exponential Distribution: statement of p.d.f. of the form, $f(x) = (1/\theta) e^{(-x/\theta)}$, mean, variance, nature of probability curve, lack of memory property.(with proof) 1.3 Paratodistribution :Form of pdf $f(x): \alpha / x(\alpha+1)$; $x \geq 1, \alpha > 0$. Mean, variance, symmetry, applications 1.3 Normal Distribution: statement of p.d.f., identification of	10	14

		parameters, nature of probability density curve, standard normal distribution, symmetry, distribution of $aX+b$, $aX+bY+c$ where X and Y are independent normal variables, computations of probabilities using normal probability table, normal approximation to binomial and Poisson distribution, central limit theorem (statement only), normal probability plot. Box Muller transformation 1.4 Numerical problems related to real life situations		
2	Jan-Feb	UNIT 2: Concepts and definitions related to testing of hypothesis 2.1 Concepts of population and sample. 2.2 Definitions: random sample from a probability distribution, parameter, statistic, standard error of estimator. 2.3 Concept of null hypothesis and alternative hypothesis (Research hypothesis), critical region, level of significance, type I and type II error, one sided and two sided tests, Test of hypothesis, p-value.	04	07
3	Feb- Mar	UNIT 3: Parametric Tests 1.1 Large Sample Tests 3.1.1 $H_0: \mu = \mu_0$ Vs $H_1: \mu \neq \mu_0, \mu < \mu_0$ (One sided and two sided tests) 3.1.2 $H_0: \mu_1 = \mu_2$ Vs $H_1: \mu_1 \neq \mu_2, \mu_1 < \mu_2, \mu_1 > \mu_2$ (One sided and two sided tests) 3.1.3 $H_0: P = P_0$	20	17

		<p>Vs $H_1: P \neq P_0, P < P_0, P > P_0$ (One sided and two sided tests) 3.1.4 $H_0: P_1 = P_2$ Vs $H_1: P_1 \neq P_2, P_1 < P_2, P_1 > P_2$ (One sided and two sided tests) 3.1.5 Numerical problems related to real life situations. 3.2 Test based on F- distribution 3.2.1 F-test for testing significance of equality of two population variances. 3.3 Tests based on t – distribution 3.3.1 $H_0: \mu_1 = \mu_2$ Vs $H_1: \mu_1 \neq \mu_2, \mu_1 < \mu_2, \mu_1 > \mu_2$ (One sided and two sided tests) 3.3.2 Paired t-test. 3.4 Tests based on Chi square distribution 3.4.1 Chi-square test for goodness of fit 3.4.2 Test for independence of attributes (mxn and 2x2) 3.5 Numerical problems related to real life situations.</p>		
4	March	<p>UNIT 4 :Simulation</p> <p>4.1 Introduction, concept of simulation , random numbers, pseudo random numbers , Advantages , Disadvantages of Simulation. Applications 4.2 Methods of simulation, Linear congruential generator and simulation from Uniform, Exponential and Normal Distribution.</p>	06	06


Prof.S.D.Adak.

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-II

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

DIV-A and B

Subject – Graph Theory

Subject Teacher: Prof.J.B.Arude

Syllabus Completed=100%

Sr.No	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	Dec - Jan	Unit 1: An Introduction to graph 1.1. Definitions, Basic terminologies and properties of graph, Graph models. 1.2. Special types of graphs, basic terminologies, properties and examples of directed graphs .Types of diagraphs. 1.3. Some applications of special types of graph. 1.4. Matrix representation and elementary results, Isomorphism of graphs.	10	15
2	Feb	Unit 2: Connected graph 2.1. Walk, trail, path, cycle, elementary properties of connectedness. Counting paths between vertices (by Warshall's algorithm). 2.2. Cut edge (Bridge), Cut vertex, cut set, vertex connectivity, edge connectivity, and Properties. 2.3. Shortest path problem, Dijkstra's algorithm.	8	13

3	Mar	Unit 3. Euler and Hamilton path. 3.1. The Konigsberg bridge problem, Euler trail, path, circuit and tour, elementary properties and Fleury's algorithm. 3.2. Hamilton path, circuit, elementary properties and examples. 3.3. Introduction of Travelling salesman problem, Chinese postman problem.	8	14
4	Feb-March	Unit 4. Trees 4.1. Definitions, basic terminologies, properties and applications of trees. 4.2. Weighted graph, definition and properties of spanning tree, shortest spanning tree, Kruskal's algorithm, Prim's algorithm. 4.3. M-ary tree, binary tree, definitions and properties, tree traversal: preorder, inorder, postorder, infix, prefix, postfix notations and examples.	10	18

Prof. Arude J.B.

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ACADEMIC YEAR-2023-2024 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	December /January	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	10	10

		priority queue		
2	January	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
3	February	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 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	12	12
4	March	UNIT 4-Hash Table:- Concept of hashing Terminologies – Hash table,Hash function, Bucket, Hash address, collision,	6	7

		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		
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Prof- Prof.Y.J.Patangade

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-IV

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

Div-A

Subject Name- Course Code: CS 242 Computer Networks

Subject Teacher- Prof. Darakhe P.G. SyllabusCompleted:100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	December	Introduction to Networks and Network Models 1.1 Data communication, components, data representation 1.2 Networks, network criteria, network types - LAN, WAN, Switching, The Internet, Accessing the Internet 1.3 Network Software- Protocol hierarchies, Design Issues of the layer, Connection Oriented and Connectionless Services, 1.4 Reference models - OSI Reference Models, TCP/IP Reference model, Connection devices in different layers, Comparison of OSI and TCP/IP Reference Models.	04	06
2	January	Lower Layers 2.1 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 2.2 Design issues of Data Link	10	10

		<p>Layer, Services - Framing, flow control, error control, congestion control, Link layer addressing</p> <p>2.3 Framing Methods - Character Count, Flag bytes with Byte Stuffing, Flags bits with Bit Stuffing, Physical Layer Coding Violations</p> <p>2.4 The Channel allocation problem, Static and dynamic allocation, Media Access Methods - Taxonomy of multiple-access protocols</p> <p>2.5 Switching and TCP/IP layers, Types - circuit switching, packet switching and message switching</p> <p>2.6 Wired LANs - Standard Ethernet characteristics, Addressing, Access method, implementation, Fast and Gigabit Ethernet</p> <p>2.7 Wireless LANs - Architectural comparison, Characteristics, Access control, IEEE 802.11</p>		
3	February	<p>Network Layer</p> <p>3.1 Network layer services - Packetizing, Routing and forwarding, other services</p> <p>3.2 Open and closed loop congestion control</p> <p>3.3 IPv4 addressing- Address space, classful addressing, Subnetting, Supernetting, classless addressing, Network address resolution (NAT)</p> <p>3.4 Forwarding of IP packets- based on destination address, based on label</p> <p>3.5 Network Layer Protocols- Internet Protocol (IP), IPv4 datagram format, Fragmentation, options</p>	12	13

		3.6 Mobile IP-addressing, agents, Three phases 3.7 Next Generation IP- IPv6 address representation, address space, address types, IPv6 protocol, packet format, extension header, Difference between IPv4 and IPv6 3.8 Routing - General idea, Algorithms - Distance vector routing, link state routing, path		
4	March	Transport Layer 4.1 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 4.2 Connectionless and Connection-oriented service, Port numbers 4.3 Transport layer protocols- User datagram protocol, user datagram, UDP services 4.4 Transmission Control Protocol - TCP Services, TCP Features, TCP Segment format, three-way handshake for connection establishment and termination, State transition	10	11

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Prof.Darakhe P.G.

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-II

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

Div:A

Subject Name- Paper I MTC-241: Computational Geometry

Subject Teacher- Prof. . Prof. J.B.Arude

SyllabusCompleted:100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	December/January	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	13
2	January	Unit 2. Three dimensional transformations:	08	08

		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		
4	February	Unit 3. Projection :Orthographic projections. Axonometric projections. Oblique projections . Single point perspective projection	08	09
5	March	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	10


 Prof. J.B.Arude

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ACADEMIC YEAR-2023-2024 SEM-II

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

Div:A

Subject Name- Paper II MTC-242: Operations Research

Subject Teacher- Prof.P.D.Bhambure

SyllabusCompleted:100%

Sr. No.	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	December/January	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	13
2	February	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	February /March	Unit 3: Assignment Models Assignment Model - Introduction Hungarian method for Assignment problem	06	09
5	March	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. P.D. Bhambure

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ACADEMIC YEAR-2023-2024 SEM-II

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

Div:A

Subject Name- Embedded System Design (ELC-241)

Subject Teacher- Prof.Y.J.Patangade.

Syllabus Completed: 100%

Sr. No	Month	Name Of Topic	Allocated Lectures	Conducted Lectures
1	February	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	February	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	February/March	Unit 3:Programming using Python:- Overview of Rasberian OS (Operating System), Installation, different types of Operating Systems Basic Python Programming	10	10

		(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		
4	March	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

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ACADEMIC YEAR-2023-2024 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	December/January	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	12
2	January	Unit 2 : Short Range Wireless Technologies and Location Tracking: Short range Technologies : Bluetooth: Bluetooth architecture, Bluetooth protocol stack, Bluetooth	12	12

		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		
3	February	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, 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 –	08	08

4	March	M.		
		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	07


 Prof.A.P.Kulkarni

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ACADEMIC YEAR-2023-2024 SEM-II

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

Div:A

Subject Name:-OPERATING SYSTEM-I I

Teacher :-Prof.Patangade Y.J.

Syllabus completed=100%

Sr.no	Month	Name Of Topics	Conducted Lectures
1	January	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 AlgorithmDeadlock DetectionRecovery from Deadlock – Process termination, Resource preemption	8
2	January	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	5

3	February	Unit_3:- Disk scheduling:- Overview, Disk Structure Disk Scheduling, FCFS Scheduling, SSTF Scheduling, Scan Scheduling- Scan Scheduling, Look Scheduling , Disk Management	5
3	February- March	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 architectures, Resource- centered architectures, System architecture – Centralized organization, Decentralized organizations, peer- to- peer systems, Hybrid architectures.	11
4	December	Unit_5:- Mobile Operating Systems Introduction, Feature 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)	7


Prof. Patangade Y.J.

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HUTATMA RAJGURU MAHA VIDYALAYA, RAJGURUNAGAR
DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 (SEM-II)

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

Subject – Compiler Construction

Subject Teacher: Prof. M.R.Ugle

Syllabus Completed=100%

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted Lectures
1	Jan+Feb	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	05
2	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	Feb	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, 3.2.3 Elimination of Left Recursion (direct & indirect) 3.2.4 Need for Left Factoring & examples Recursive Descent Parsing: Definition Implementation of Recursive Descent Parser Using Recursive Procedures 3.4 Predictive [LL (1)] Parser (Definition, Model) 3.4.1 Implementation of Predictive Parser [LL (1)] 3.4.2 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	14

		<p>Relations form Associativity & Precedence</p> <p>Operator Precedence Grammar Algorithm for LEADING & TRAILING (with ex.)</p> <p>Algorithm for Operator Precedence Parsing (with ex.)</p> <p>Precedence Functions Shift Reduce Parser Reduction, Handle, Handle Pruning Stack Implementation of Shift Reduce Parser (with examples)</p> <p>LR Parser: Model, Types [SLR (1), Canonical LR, LALR]-Method & examples. YACC (from Book 3) –program sections, simple YACC program for expression evaluation</p>		
4	March	<p>UNIT 4: Syntax Directed Definition</p> <p>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</p>	07	04
5	March	<p>UNIT 5 : Code Generation and Optimization</p> <p>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.</p>	07	05

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DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 (SEM-II)

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

Subject – OOP using java-II

Subject Teacher: Prof. M.R.Ugle

Syllabus Completed=100%

Sr.No.	Month	Name of Topics	Allocated Lectures	Conducted Lectures
1	Jan+Feb	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	06	06
2	Feb	UNIT 2: Multithreading What are threads? Life cycle of thread Creating threads - Thread class , Runnable interface Thread priorities Running multiple threads Synchronization and inter thread communication	06	04
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	March	UNIT 4: Servlets and JSP Introduction to Servlet and Hierarchy of Servlet Life cycle of servlet Handling 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 elements - Declarations, Expressions, Scriptlets, Comments JSP Directives - Page Directive, include directive Mixing Scriptlets and HTML	12	04

		JSP Actions - jsp:forward , jsp:include, jsp:useBean, jsp:setProperty and jsp:getProperty		
5	March	UNIT 5 : Spring Framework Introduction of Spring framework Spring Modules / Architecture Spring Applications Spring MVC Spring MVC Forms, Validation	06	04

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-II

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

DIV-A

Subject – **Data Analytics**

Subject Teacher: **Prof. Patole S.V.**

Syllabus Completed=100%

Sr.No	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	January	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 models	6	7
2	January	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	6	6

		observations Types of machine learning Supervised learning, Unsupervised learning, Semi-supervised learning, ensemble techniques Regression models concept of classification, clustering and reinforcement learning		
3	February	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 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	12	11
4	March	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	12	13

		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		
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Prof. Patole. S.V.

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-II

Class-~~X~~**.Y.B.SC (Comp.Sci)**

DIV-A

Subject:Software Testing Tools

Subject Teacher: Prof. Patole S.V.

Syllabus Completed=100%

Sr.No	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	January	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 Evaluating value prediction models	4	4
2	February	Unit 2 : Test cases for simple programs Write simple programs make use of loops and control structures. Write Test Cases for above programs	4	3
3	February	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	4	4
4	February/ March	Unit 4 : Defect Report Defect Life Cycle Classification of Defect Write Defect Report	3	2
5	March	Unit 5 : Testing Tools How to make use of Automation Tools Types of Testing Tools	3	3


Prof. Patole. S.V.

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-II

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

DIV-A

Subject – Web Technologies -II

Subject Teacher: Prof.Patole S.V.

SyllabusCompleted=100%

Sr.No	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	January	Unit 1:Introduction to Web Techniques Variables Server information Processing forms Setting response headers Maintaining state PHP error handling	6	5
2	January	Title : 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 Development(ASD)	6	6
3	January / February	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,	10	11

		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		
4	February/ March	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	6	5
5	March	Unit 5:PHP frameworkCodeIgniter 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	8	6


 Prof. Patole. S.V.

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SYLLABUS COMPLETION REPORT
ACADEMIC YEAR-2023-2024 SEM-I

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

DIV-A

Subject – Software Testing

Subject Teacher: Prof.Darakhe P.G.

SyllabusCompleted=100%

Sr.No	Month	Name OF Topics	Allocated Lectures	Conducted lectures
1	January	Introduction to Software Testing 1.Basics of Software Testing – faults, errors and failures 2.Testing objectives 3.Principles of testing 4.Testing and debugging 5.Testing metrics and measurements 6.Verification and Validation 7.Testing Life Cycle	5	5
2	January	Software Testing Strategies & Techniques 1.Testability - Characteristics lead to testable software. 2.Test characteristics 3.Test Case Design for Desktop, Mobile, Web application using Excel 4.White Box Testing - Basis path testing, Control Structure Testing. 5.Black Box Testing-	10	11

		Boundary Value Analysis, Equivalence partitioning. 6.Differences between BBT & WBT Chapter 3 Levels of Testing 1		
3	February	Levels of Testing 1.A Strategic Approach to Software Testing 2.Test strategies for conventional Software 3.Unit testing 4.Integration testing – Top- Down, Bottom-up integration 5.System Testing – Acceptance, performance, regression, Load/Stress testing Security testing, Internationalization testing. 6.Alpha, Beta Testing 7.Usability and accessibility testing 8.Configuration, compatibility testing	10	11
4	March	Testing Web Applications 1.Dimension of Quality, 2.Error within a WebApp Environment 3.Testing Strategy for WebApp 4.Test Planning 5.The Testing Process –an overview	6	6
5	March	Agile Testing 1.Agile Testing, 2.Difference between Traditional and Agile testing, 3.Agile principles and values, 4.Agile Testing Quadrants, 5.Automated Tests.	6	6

Prof. Darakhe. P.G.

Pallavi