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Shri Vaishnav Institute Of Information Technology
Master of Technology (CSE)
Choice Based Credit System (CBCS)-2024-26
SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
MTCS201N	DCC	Advance Computer Architecture & Organization	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. Describe current and emerging trends in computer architectures, focusing on performance and the hardware/software interface.
2. Analyzing fundamental issues in architecture design and their impact on application performance.
3. Identify the performance and efficiency in advanced multiple-issue processors
4. Identify and Analyzing various memory models.
5. Describe various techniques to enhance a processors ability.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Know the classes of computers, and new trends and developments in computer architecture
2. Understand pipelining, instruction set architectures, memory addressing.
3. Understand the performance metrics of microprocessors, memory, networks.
4. Understand the various techniques to enhance a processors ability to exploit Instruction-level parallelism (ILP), and its challenges.
5. Understand exploiting ILP using dynamic scheduling, multiple issue, and speculation.
6. Understand multithreading by using ILP and supporting thread-level parallelism (TLP).
7. Understand the performance and efficiency in advanced multiple-issue processors.
8. Understand symmetric shared-memory architectures and their performance.
9. Understand multiprocessor cache coherence using the directory based and snooping class of protocols.
10. Understand the various models to achieve memory consistency.

UNIT I 10HRS

Overview of Parallel Processing and Pipelining Processing, study and comparison of uni-processors and parallel processors, Evolution of parallel processors, Necessity of high performance, Architectural Classification, Applications of parallel processing, Instruction level Parallelism and Thread Level Parallelism.

UNIT II 9HRS

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MTCS201N	DCC	Advance Computer Architecture & Organization	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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Principles and implementation of Pipelining, Pipeline Architecture, Study and comparison of processors with and without pipelining, Linear pipeline processor, Nonlinear pipeline processor Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling -score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscaler pipeline design, Super pipeline processor design.

UNIT III **8HRS**

Study and comparison of Vector and array processors,Vector Processing Principles,
Vector instruction types, Vector-access memory schemes. Vector supercomputer architecture, SIMD Computer Organization Masking and Data network mechanism, distributed memory model and shared memory model, Parallel Algorithms For Array Processors: Matrix Multiplication. Sorting, SIMD computer organization, Implementation issues of Matrix multiplication and sorting on array processor and their analysis

UNIT IV **7HRS**

Microprocessor Architectures, study and comparison of Loosely and Tightly coupled multiprocessors.Loosely and Tightly coupled multiprocessors, Processor characteristics of multiprocessors, Inter Processor communication network, Time shared bus, Crossbar switch, Multiport Memory Model, Memory contention and arbitration techniques, Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel.

UNIT V **8HRS**

Study of Architecture of Multithreaded processors, Latency hiding techniques, Principles of multithreading, Issues and solutions, Parallel Programming Techniques: Message passing program development, Synchronous and asynchronous message passing, Message passing parallel programming, Shared Memory Programming, Data Parallel Programming. Implementation issues of a multithreaded program.

Text books:

1. Kai Hwang, Faye A. Briggs, "Computer Architecture and Parallel Processing" McGraw-Hill international Edition.

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MTCS201N	DCC	Advance Computer Architecture & Organization	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Reference:

1. J.P.Hayes, "computer Architecture and organization"; MGH.
2. V.Rajaranam & C.S.R.Murthy, "Parallel computer"; PHI Learning.
3. Kain,"Advance Computer Architecture: - A System Design Approach", PHI Learning
4. M.J Flynn, "Computer Architecture, Pipelined and Parallel Processor Design"; Narosa Publishing.
5. Hwang and Briggs, "Computer Architecture and Parallel Processing"; MGH.
6. David E. Callav & Jaswinder Pal Singh Marge Kaufmann"Advance Computer Architecture", EIS India.
7. Sajjan G. Shiva, Taylar & Francis, "Advance Computer Architecture

Suggested list of Practicals:-

1. Pi Calculation for implementing parallel programming
2. Implement Array Processing in respect of an array processor
3. Write a program for implementing Client server architecture.
4. Implement Reservation Table program for pipelining.
5. Implementation of multithreading in java.
6. Implement RMI using one web application.
7. Implement Remote Procedure Call on windows.
8. Implement Client – server communication in C/C++/Java.
9. Write a program to calculate access time of each storage device for same file. Case study of VLIW processor, Pentium pro, CRAY Computer systems.

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			THEORY			PRACTICAL					
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MTCS202N	DCC	Advance Database Management System	60	20	20	30	20	2	0	2	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1. Describe database management system internals. Understand and describe internal algorithms in detail. Decide on optimization issues given a known database workload, by manipulating indexes, choosing more adequate data types, and modifying queries.
2. Identify opportunities for the use of the object model, and design and code client code to manipulate an object database.
3. Analyze and optimize transactional code, identifying causes of possible anomalies and correct them.
4. Identify and be able to use recent and advanced database techniques (e.g. in concurrency control, buffer management, and recovery).
5. Analyze, describe and use other models than the Relational. Analyze, compare and evaluate alternative database architectures and models in different application contexts. Identify limitations of the standard Relational databases in certain application domains, e.g. for multidimensional data, or unstructured data.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.
2. Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
3. Be familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B-tree, and hashing.
4. Master the basics of query evaluation techniques and and query optimization.
5. Be familiar with the basic issues of transaction processing and concurrency control.

UNIT I **10HRS**

Introduction to Database Systems: Database System Concepts and Architecture, Data Models, Data Independence, SQL: DDL, DML, DCL, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.Query Processing and Optimization: Query Processing, Syntax Analyzer, Query Decomposition, Query Optimization, Heuristic Query Optimization, Cost Estimation, Cost Functions for Select, Join,

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MTCS202N	DCC	Advance Database Management System	60	20	20	30	20	2	0	2	3

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Query Evaluation Plans.

UNIT II **9HRS**

Object Oriented and Object Relational Databases Object Oriented Concepts, Object Oriented Data Model, Object Definition Language, Object Query Language, Object Relational Systems, SQL3, ORDBMS Design.

UNIT III **8HRS**

Transaction Processing and Concurrency Control: Transaction Processing Concepts, Concurrency Control Techniques: Two-phase Locking, Timestamp Ordering, Multiversion, Validation, Multiple Granularity Locking.

UNIT IV **7HRS**

Backup and Recovery: Types of Database Failures, Types of Database Recovery, Recovery Techniques: Deferred Update, Immediate Update, Shadow Paging, Checkpoints, Buffer Management.

UNIT V **8HRS**

Introduction to Data Warehousing and Data Mining: Introduction to OLAP, OLTP, Data Warehouse, Data Marts, Data Mining, Data Mining Process. Distributed Databases: Distributed Database Concepts, Advantages and Disadvantages, Types of Distributed Database Systems, Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design, Five Level Schema Architecture, Query Processing, Concurrency Control and Recovery in Distributed Databases. Commercial Databases: Commercial Database Products, Familiarity with IBM DB2 Universal Database, Oracle, Microsoft SQL Server, MySQL, their features.

Text book:

1. C. J. Date: An Introduction to Database Systems , Addison-Wesley

References:

1. Avi Silberschatz, Henry F. Korth ,S. Sudarshan ,Data Base System Concepts, TMH
2. Patrick O'Neil & Elizabeth O'Neil, Database Principles, Programming and Performance,
3. Morgan Kaufmann Hardcourt India
4. Gillenson, Fundamental of Data Base Management Sytem, Willey India
5. Ceri & Pelagatti, Distributed Databases Principles & Systems,TMH
6. Paulraj Ponniah, Data Ware Housing Fundamental, Willey India.
7. Jiawei Han, Data Mining Concept & Techniques, Elsevier Pub.

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MTCS202N	**DCC**	**Advance Database Management System**	**60**	**20**	**20**	30	20	2	0	2	**3**

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Suggested list of Practicals:-

1. Distributed Database for Bookstore
2. Deadlock Detection Algorithm for distributed database using wait- for graph
3. Object Oriented Database – Extended Entity Relationship (EER)
4. Parallel Database – University Counselling for Engineering colleges
5. Parallel Database – Implementation of Parallel Join & Parallel Sort
6. Active Database – Implementation of Triggers & Assertions for Bank Database
7. Deductive Database – Constructing Knowledge Database for Kinship Domain (Family Relations)
8. Study and Working of WEKA Tool
9. Query Processing – Implementation of an Efficient Query Optimizer
10. Designing XML Schema for Company Database.

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MTRM301	AECC	Research Methodology in Engineering	60	20	20	0	0	3	1	0	4

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

The course has been developed with orientation towards research related activities and recognizing
1. the ensuing knowledge as property.
2. To plan and design business research using scientific and statistical methods.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Demonstrate understanding of research methodology.
2. Apply the statistical concepts in business research.
3. Validate statistical statements relating to business research.

SYLLABUS

UNIT–I 10HRS
Business Research

1. An overview: Research process
2. Types of Research - Exploratory Research, Descriptive Research, Causal Research, Analytical Research
3. Problem formulation, Management problem v/s. Research problem
4. Approaches to Research
5. Importance of literature review
6. Business Research Design: Steps involved in a research design

UNIT–II 9HRS
Sampling and Data Collection

1. Sampling and sampling distribution: Meaning, Steps in Sampling process
2. Types of Sampling - Probability and Non probability Sampling Techniques
3. Data collection: Primary and Secondary data – Sources – Advantages/Disadvantages
4. Data collection Methods: Observations, Survey, Interview and Questionnaire design, Qualitative Techniques of data collection.

UNIT–III 8HRS
Measurement and Scaling Techniques

1. Nominal Scale, Ordinal Scale, Interval Scale, Ratio Scale, Criteria for good measurement
2. Attitude measurement – Likert's Scale, Semantic Differential Scale, Thurstone-equal appearing interval scale

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MTRM301	AECC	Research Methodology in Engineering	60	20	20	0	0	3	1	0	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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UNIT–IV 7HRS

Statistical Tools for Data Analysis

1. Measures of central tendency - Mean, Median, Mode ,Quartiles, Deciles and Percentiles
2. Measures of Dispersion: Standard Deviation – Variance – Coefficient of Variance, Skewness
3. Correlation - Karl Pearson's coefficient of Correlation, Rank Correlation
4. Regression: Method of Least Squares
5. Formulation of hypothesis
6. Testing of hypothesis
7. Type I and Type II Errors.
8. Parametric tests: Z-Test, t-test, F-test, Analysis of Variance – One-Way and Two-way classification.
9. Non parametric tests - Chi-Square test

UNIT–V 8HRS

Report writing

1. Reporting Research
2. Types of reports
3. Characteristics of a research report

SUGESTED READINGS:

1. MalhotraNaresh K. (2008). Marketing Research. Pearson publishers, Latest Edition.
2. Zikmund, Babin,Carr,Griffin (2003). Business Research Methods. Cengage Learning, India, Latest Edition.
3. Cooper Donald R and Schindler Pamela S. (2006). Business Research Methods. McGraw-Hill Education, Latest Edition.
4. Anderson, Sweeney, William, Cam (2014). Statistics for Business and Economics. Cengage Learning, Latest Edition.
5. Krishnaswami O. R., Ranganatham M. (2011). Methodology of Research in Social Sciences. Himalaya Publishing House, Latest Edition.
6. Levin and Rubin (2008). Statistics for Management. Dorling Kindersley Pvt Ltd, Latest Edition.
7. Sekaran Uma (2003). Research Methods for Business. Wiley India, Latest Edition.
8. Gupta S. P. (2014). Statistical Methods. Sultan Chand and Sons, Latest Edition.
9. Aczel and Sounderpandian (2008). Complete Business Statistics. Tata-McGraw Hill,Latest Edition.
10. Kothari C. R. (2004). Research Methodology. VishwaPrakashan, Latest Edition.

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MTCS203N	**DCC**	**Advance Computer Network**	**60**	**20**	**20**	30	20	2	0	2	**3**

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Course Educational Objectives (CEOs):

1. To be able to demonstrate an understanding of the physical properties and performance characteristics of communication media; specifically copper cable, fibre optics and wireless networks
2. To be able to demonstrate an understanding of the importance of communication standards, including an appreciation of protocol layer models and enhancements to those standards
3. To be able to demonstrate an appreciation of the theory and practice of common local area networks including virtual and wireless LANs.
4. To be able to demonstrate an appreciation of the theory and practice of wide area networks and their interconnection
5. To be able to demonstrate an appreciation of the significance of network and inter-network protocols; specifically IPv4, IPv6, TCP and UDP
6. To be able to describe the importance of reliability and quality of service, including examples of error recovery strategies, traffic differentiation and prioritization

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies;
2. Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols;
3. Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure
4. Have a working knowledge of datagram and internet socket programming

Syllabus

UNIT I **10HRS**

Introduction Concepts: Goals and Applications of Networks, Requirements , Network architecture , Networking principles, Network services and Layered architecture .The OSI reference model, services, Network Topology Design - Delay Analysis, Back Bone Design, Local Access Network Design, Physical Layer Transmission Media, Switching methods, ISDN, Terminal Handling

UNIT II **9HRS**

Medium Access sub layer: Medium Access sub layer - Channel Allocations, LAN protocols -

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MTCS203N	**DCC**	**Advance Computer Network**	**60**	**20**	**20**	30	20	2	0	2	**3**

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ALOHA protocols - Overview of IEEE standards - FDDI. Data Link Layer - Elementary Data Link Protocols, Sliding Window protocols, Error Handling Protocol architecture - Protocols - OSI - TCP/IP - LAN architecture - Topologies - MAC - Ethernet, Fast Ethernet, Token ring, Wireless LANS ,Switches.

UNIT III **8HRS**

Circuit switching vs. packet switching / Packet switched networks – IP – ARP – RARP – DHCP – ICMP – Queueing discipline – Routing algorithms – RIP – OSPF – Subnetting – CIDR – Interdomain routing – BGP – Ipv6 – Multicasting – Congestion avoidance in network layer

UNIT IV **7HRS**

Transport Layer - Design issues, connection management, session Layer Design issues, remote procedure call. Presentation Layer-Design issues, Data compression techniques, cryptography - TCP - Window Management UDP – TCP – Adaptive Flow Control – Adaptive Retransmission - Congestion control – Congestion avoidance – QoS.). Application Layer: Application Layer: File Transfer, Access and Management, Electronic mail, Virtual Terminals, Other application. Example Networks - Internet and Public Networks

UNIT V **8HRS**

Email (SMTP, MIME, IMAP, POP3) – HTTP – DNS- SNMP – Telnet – FTP – Security – PGP – SSH. Control of networks: objectives and methods of control, Circuit switched networks, datagram and ATM networks. Mathematical background for control of networks like Circuit switched networks, Datagram and ATM networks Wireless LAN, 802.11, DHCP, outing in the Internet, MOSTF DVMRP, IP Over ATM, Storage Area Networks, Traffic Engineering Planning, WAP, Tiny OS, NEST Cellular Network, Multimedia Over Internet, RTP, RSVP, Tuning RED for Web Traffic, XCP, Skype, Internet Telephony, Enterprise Network Security, SNAT, DNAT.

Text Book:

1. Computer Networks (4th edition), Andrew Tanenbaum, Prentice Hall

Reference Books:

1. Computer Networking- A Top-Down approach, 5th edition, Kurose and Ross, Pearson
2. Computer Networks- A Top-Down approach, Behrouz Forouzan, McGraw Hill
3. Computer Networking and the Internet,Fred Halsall, Addison Wesley
4. Data Communications and Networking, Behrouz Forouzan, McGraw Hill
5. TCP/IP Protocol Suite (3rd edition), Behrouz Forouzan, McGraw Hill

Suggested list of Practicals:-

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MTCS203N	**DCC**	**Advance Computer Network**	**60**	**20**	**20**	30	20	2	0	2	**3**

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1. Simulate cyclic redundancy check (crc) error detection algorithm (crc) for noisy channel.
2. Simulate and implement stop and wait protocol for noisy channel.
3. Simulate and implement go back n sliding window protocol.
4. Simulate and implement selective repeat sliding window protocol.
5. Simulate and implement distance vector routing algorithm.
6. Simulate and implement dijkestra algorithm for shortest path routing.
7. Programs for ip address conversion function
8. Client server applications using inter process communication and synchronous
    a. Mechanisms fifo, Message queues, Shared memory
9. Connection oriented client server applications with tcp
10. Connectionless client server applications with UDP
11. Programs using rpc remote procedure call
12. Client server applications using concurrent server
13. Client server applications using multi protocol server.

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MTCS204N	DCC	Data science and Machine learning	60	20	20	30	20	2	0	2	3

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Course Educational Objectives (CEOs):

The objective of this course is to impart necessary knowledge of the mathematical foundations needed for data science and develop programming skills required to build data science applications.

COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Demonstrate understanding of the mathematical foundations needed for data science.
2. Collect, explore, clean, munge and manipulate data.
3. Implement models such as k-nearest Neighbors, Naive Bayes, linear and logisticregression,decision trees, neural networks and clustering.
4. Build data science applications using Python based toolkits.

SYLLABUS

UNIT–I

Introduction to Data Science: Concept of Data Science, Traits of Big data, Web Scraping, AnalysisvsReporting.

UNIT–II

Introduction to Programming Tools for Data Science: Toolkits using Python: Matplotlib,NumPy,Scikit-learn, NLTK, Visualizing Data: Bar Charts, Line Charts, Scatterplots, Working with data:Reading Files, Scraping the Web, Using APIs (Example: Usingthe Twitter APIs),Cleaning and Munging, Manipulating Data, Rescaling,Dimensionality Reduction.

UNIT–III

Mathematical Foundations: Linear Algebra: Vectors, Matrices,Statistics: Describing a Single Set ofData, Correlation, Simpson's Paradox,Correlation and Causation, Probability: Dependence andIndependence, Conditional Probability, Bayes'sTheorem, Random Variables, ContinuousDistributions, The Normal Distribution,The Central Limit Theorem, Hypothesis and Inference:Statistical Hypothesis Testing, Confidence Intervals, Phacking,Bayesian Inference.

UNIT–IV

Machine Learning: Overview of Machine learning concepts – Over fitting and train/test splits, Typesof Machinelearning – Supervised, Unsupervised, Reinforced learning, Introduction to Bayes Theorem,LinearRegression- model assumptions, regularization (lasso, ridge, elastic net), Classification andRegression algorithms- Naïve Bayes, K-Nearest Neighbors, logistic regression, support vectormachines (SVM), decision trees, and random forest, Classification Errors, Analysis

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MTCS204N	**DCC**	**Data science and Machine learning**	**60**	**20**	**20**	30	20	2	0	2	**3**

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

of TimeSeries- Linear Systems Analysis, Nonlinear Dynamics, Rule Induction, Neural Networks-Learning And Generalization,Overview of Deep Learning.

UNIT–V

Case Studies of Data Science Application: Weather forecasting, Stock market prediction, Object recognition, Real Time Sentiment Analysis.

Text book:

1. Joel Grus, "Data Science from Scratch: First Principles with Python", O'Reilly Media.

Reference:

1. AurélienGéron, "Hands-On Machine Learning with Scikit-Learn and Tensor Flow:Concepts, Tools, and Techniques to Build Intelligent Systems", 1st Edition, O'Reilly Media.
2. Jain V.K., “Data Sciences”, Khanna Publishing House, Delhi.
3. Jain V.K., “Big Data and Hadoop”, Khanna Publishing House, Delhi.
4. Jeeva Jose, “Machine Learning”, Khanna Publishing House, Delhi.
5. Chopra Rajiv, “Machine Learning”, Khanna Publishing House, Delhi.
6. Ian Goodfellow, YoshuaBengio and Aaron Courville, "Deep Learning", MIT Press http://www.deeplearningbook.org
7. Jiawei Han and Jian Pei, "Data Mining Concepts and Techniques", Third Edition, MorganKaufmann Publishers

Suggested list of Practicals:-

1. Write a programme in Python to predict the class of the flower based on available attributes.
2. Write a programme in Python to predict if a loan will get approved or not.
3. Write a programme in Python to predict the traffic on a new mode of transport.
4. Write a programme in Python to predict the class of user.
5. Write a programme in Python to indentify the tweets which are hate tweets and which are not.
6. Write a programme in Python to predict the age of the actors.
7. Mini project to predict the time taken to solve a problem given the current status of the user

Shri Vaishnav Vidyapeeth Vishwavidyalaya
Shri Vaishnav Institute Of Information Technology
Master of Technology (CSE)
Choice Based Credit System (CBCS)-2024-26
SEMESTER-II

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
MTCS207N	SEC	Software Construction Lab	0	0	0	0	50	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

1 Apply the fundamentals of software construction as outlines in this course to an actual software development project.
2. Demonstrate by example the key construction life cycle models
3. Interpret key practical construction considerations such as design, languages, coding, testing, quality and reuse
4. Evaluate and provide examples of the key construction technologies in a typical software construction project
5. Explain the application of software construction tools such as GUI builders, unit testing tools, profiling, performance analysis and slicing tools.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Students will able to understand tools used in software construction.
2. Students will able implement software process models & can use CASE tools.
3. Students will able prepare projects plan and implement projects.

UNIT 1

Course Modules: Software Construction Fundamentals, Minimizing Complexity, Anticipating Change, Constructing for Verification, Reuse Standards in Construction,

UNIT II

Construction in Life Cycle Models, Construction Planning, Construction Measurement, Construction Design, Construction Languages, Coding.

UNIT III

Construction Testing, Construction for Reuse, Construction with Reuse, Construction Quality, Integration

UNIT IV

API Design and Use, Object-Oriented Runtime Issues, Parameterization and Generics, Assertions, Design by Contract, and Defensive Programming, Error Handling, Exception Handling, and Fault Tolerance, Executable Models, State-Based and Table-Driven Construction Techniques, Runtime

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Configuration and Internationalization, Grammar-Based Input Processing, Concurrency Primitives Middleware

UNIT V

Constructing Heterogeneous Systems, Performance Analysis and Tuning, Platform Standards, Test-First Programming.

Development Environments, GUI Builders, Unit Testing Tools,Profiling, Performance Analysis, and Slicing Tools

Text Books:

1. Karl J. Lieberherr, Ian M. Holland, Assuring Good Style for Object-Oriented Programs, 1989, LieberherrHolland89.

Reference:

1. D. L. Parnas, On the criteria to be used in decomposing systems into modules, 1972, Parnas72
2. W. Wulf and Mary Shaw, Global variable considered harmful, 1973, WulfShaw84
3. John Hughes, Why functional programming matters, 1990 Hughes89
4. Robert C. Martin, Design principles and design patterns, Martin00.

Suggested list of Practicals:-

1. Introduction to UML and Course Outlines. Tools Description.
2. Introduction to Rational Rose and Practical Implementation.
3. Introduction to class Diagram.
4. Class Diagram in Detail and Tasks Done by using Rational Rose.
5. Introduction to Use-case Diagram, its Detail and implementation by using Rational Rose.
6. Lab Quiz: 01 (Use-case Diagram)
7. Introduction to Sequence Diagram.
8. Sequence Diagram in Detail and Tasks by using Rational Rose.
9. Introduction of Component Diagram and its implementation by using Rational Rose.
10. Introduction to Collaboration Diagram and Task by using Rational Rose.
11. Test cases and Few Scenarios of test-cases in real life.
12. Introduction to TestLog and An implementation on it.
13. Lab Quiz: 02 (Test-cases)
14. Parser Language: Introduction and Code Generation Technique.
15. Presentations based on Parser Lang