



Shri Vaishnav Vidyapeeth Vishwavidyalaya

B. Tech., B. Tech. + M. Tech. and B. Tech. + MBA (Information Technology)

Choice Based Credit System (CBCS) 2016-17

SEMESTER V

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS501	UG	THEORY OF COMPUTATION	60	20	20	-	-	3	1	-	4

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 OBJECTIVES:

The student will have ability to:

1. To introduce concepts in automata theory and theory of computation.
2. To identify different formal language classes and their relationships.
3. To design grammars and recognizers for different formal languages.

COURSE OUTCOMES:

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

1. Ability to relate practical problems to languages, automata, and computability.
2. Ability to demonstrate an increased level of mathematical sophistication.
3. Ability to apply mathematical and formal techniques for solving problems.

SYLLABUS

UNIT-I

Introduction: Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), NFA with epsilon transition, Language of NFA, Equivalence of NFA and DFA, Minimization of Finite Automata, Distinguishing one string from other, Myhill-Nerode Theorem.

UNIT-II

Regular Expression (RE): Definition, Operators of regular expression and their precedence, Algebraic laws for Regular expressions, Kleen's Theorem, Regular expression to FA, DFA to Regular expression, Arden's Theorem, Non Regular Languages, Pumping Lemma for regular Languages.

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SEMESTER V

Application of Pumping Lemma, Closure properties of Regular Languages, Decision properties of Regular Languages, FA with output: Moore and Mealy machine, Equivalence of Moore and Mealy Machine, Applications and Limitation of FA.

UNIT-III

Context Free Grammar (CFG) and Context Free Languages (CFL): Definition, Examples, Derivation, Derivation trees, Ambiguity in Grammar, Inherent ambiguity, Ambiguous to Unambiguous CFG, Useless symbols, Simplification of CFGs, Normal forms for CFGs: CNF and GNF, Closure properties of CFLs, Decision Properties of CFLs: Emptiness, Finiteness and Membership, Pumping lemma for CFLs.

UNIT-IV

Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG.

UNIT-V

Turing machines (TM): Basic model, definition and representation, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, TM as Computer of Integer functions, Universal TM, Church's Thesis, Recursive and recursively enumerable languages, Halting problem, Introduction to Undecidability, Undecidable problems about TMs. Post correspondence problem (PCP), Modified PCP, Introduction to recursive function theory.

TEXT BOOKS:

1. Hopcroft and Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education, 3rd edition, 2014

REFERENCES:

1. I. Martin J. C., "Introduction to Languages and Theory of Computations", TMH, 4th edition, 2010
2. Peter Linz, "An Introduction to Formal Language and Automata", Narosa Pub. House, 2011
3. Papadimitriou, C. and Lewis, C. L., "Elements of the Theory of Computation", PHI, 1997
4. K.L.P Mishra & N.Chandrasekaran, "Theory of Computer Science", PHI Learning

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BTCS503	UG	COMPUTER GRAPHICS & MULTIMEDIA	60	20	20	30	20	3	0	2	4

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

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COURSE OBJECTIVES:

The student will have ability to:

1. Understood basic concepts of computer graphics.
2. Acquire knowledge about drawing basic shapes such as lines, circle ellipse, polygon.
3. Shall be able to perform processing of basic shapes by various processing algorithms /techniques.
4. Acquire knowledge about two and three dimensional transformations.
5. Shall be able to apply the transformation algorithms to the basic shapes.
6. Shall be able to perform Multimedia Operation.

COURSE OUTCOMES:

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

1. Understood basic concepts of computer graphics
2. Acquire knowledge about drawing basic shapes such as lines, circle ellipse, polygon and shall be able to perform processing of basic shapes by various processing algorithms /techniques.
3. Acquire knowledge about two and three dimensional transformations and shall be able to apply the transformation algorithms to the basic shapes.
4. Shall have the basic knowledge of windowing and clipping and shall be able to apply various algorithms of clipping.
5. Acquire knowledge about Visible Surface Detection methods, Illumination Models and Surface Rendering
6. Acquire knowledge to apply advanced techniques such as fractals, introduction to open GL and Multimedia Systems.

SYLLABUS

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SEMESTER V

UNIT-I

Introduction to Computer Graphics:- What is Computer Graphics?, Where Computer Generated pictures are used, Elements of Pictures created in Computer Graphics display devices, Graphics input primitives and Devices. **Introduction to OpenGL:-** Getting started Making pictures, Drawing basic primitives Simple interaction with mouse and keyboard

UNIT-II

Points and Lines, Antialiasing **Line Drawing Algorithm:-** DDA line drawing algorithm, parallel drawing algorithm Bresenham's drawing algorithm with example. **Circle and Ellipse generating algorithms:-** Mid-point Circle algorithm with example Mid-point Ellipse algorithmic-point Ellipse algorithm with example **Parametric Cubic Curves:-** Bezier curves B-Spline curves **Filled Area Primitives:-** Scan line polygon fill algorithm, Pattern fill algorithm Inside-Outside Tests, Boundary fill algorithms, Flood fill algorithms

UNIT-III

2D Geometric Transformations Basic transformation, Matrix representation and Homogeneous Coordinates Composite transformation other transformations. Transformation between coordinated systems. Window to Viewport coordinates transformation,

Clipping operations – Point clipping, Line clipping:-Cohen – Sutherland line clipping Liang – Barsky line clipping Midpoint subdivision

Polygon Clipping-Sutherland – Hodgeman polygon clipping Weiler – Atherton polygon clipping. 3D object representation methods B-REP, sweep representations, CSG

Basic transformations- Translation, Rotation, Scaling

Other transformations- Reflection, Rotation about arbitrary axis Composite transformations Projections – Parallel and Perspective 3D clipping

UNIT-IV

3D Geometric Transformations and 3D Viewing Classification of Visible Surface Detection algorithm:- Translation, Rotation, Scaling

Other transformations:- Reflection, Rotation about an arbitrary axis Composite transformations Projections, Back Surface detection method Depth Buffer method Scan line method BSP tree method, Area Subdivision method.

UNIT-V

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Multimedia System: An Introduction, Multimedia hardware, Multimedia System Architecture. Data & File Format standards.i.e RTF, TIFF, MIDI, JPEG, DIB, MPEG,Audio: digital audio, MIDI, processing sound, sampling, compression. Video: Avi, 3GP,MOV, MPEG , compression standards, compression through spatial and temporal redundancy. Multimedia Authoring.

TEXT BOOKS:

1. Sinha and Udai , "Computer Graphics", Tata McGraw Hill
2. Parekh "Principles of Multimedia" Tata McGraw Hill
3. Prabhat k Andleigh, KiranThakral , "Multimedia System Design " PHI Pub.
4. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.

REFERENCES:

1. Computer Graphics, C Version, 2e Paperback – 2002
2. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education, second edition 2003.
3. Judith Jeffcoate, "Multimedia in practice technology and Applications", PHI, 1998.
4. David F Rogers, "Procedural elements for Computer Graphics", Tata McGraw Hill, Second Edition.
5. Foley, VanDam, Feiner and Hughes, "Computer Graphics Principles & Practice in C", Second edition, Pearson Education.
6. David Hillmaa, "Multimedia Technology & Applications, Delmar, 1998.

LIST OF EXPERIMENTS

1. Implement DDA Line Drawing algorithm
2. Implement Bresenham's line drawing algorithm.
3. Implement Mid-Point circle drawing algorithm.
4. Implement Mid-Point ellipse drawing algorithm.
5. Implement cubic Bezier curve.
6. Implement a menu-driven program for 2D transformations.
7. Implement Line clipping algorithm using Cohen-Sutherland.
8. Implement Polygon Clipping using Sutherland Hodgeman.
9. Implement Scan line fill algorithm.
10. Study of Multimedia and Program for Flash.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT502	UG	COMPUTER NETWORKS	60	20	20	30	20	3	1	2	5

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

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COURSE OBJECTIVES:

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.

COURSE OUTCOMES:

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of sub netting and routing mechanisms.

SYLLABUS

UNIT-I

Computer Network: Definitions, goals, components, Architecture, Classifications & Types. Layered Architecture: Protocol hierarchy, Design Issues, Interfaces and Services, Connection Oriented & Connectionless Services, Service primitives, Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP. Network standardization.

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SEMESTER V

UNIT-II

Data Link Layer: Need, Services Provided, Framing, Flow Control, Error control. Data Link Layer Protocol: Elementary & Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Hybrid ARQ. Bit oriented protocols: SDLC, HDLC, BISYNC, LAP and LAPB.

UNIT-III

MAC Sublayer: MAC Addressing, Binary Exponential Back-off (BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted- ALOHA), CSMA/CA, CSMA/CD Ethernet, token bus, token ring, (IEEE 802.3, IEEE 802.4, IEEE 802.5)

UNIT-IV

Network Layer: Need, Services Provided, Design issues, Routing and congestion in network layer, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multi cast Routing. IP protocol, IP Addresses, Subnetting, Comparative study of IPv4 & IPv6, Mobile IP.

UNIT-V

Transport Layer: Design Issues, UDP: Header Format, Per-Segment Checksum, Carrying Unicast/Multicast Real-Time Traffic, TCP: Connection Management, Reliability of Data Transfers, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer Management. Session layer: Authentication, Authorisation, Session layer protocol. Presentation layer: Data conversion, Encryption and Decryption, Presentation layer protocol (LPP, Telnet, X.25 packet Assembler/Disassembler). Application Layer: WWW and HTTP, FTP, SSH, Email (SMTP, MIME, IMAP), DNS, Network Management (SNMP).

TEXT BOOKS:

1. "Computer Networks" Andrew S. Tanenbaum, David J. Wetherall, Pearson Education.

REFERENCES:

1. "Networking Fundamentals", Kaveh Pahlavan, Prashant Krishnamurthy, Wiley Publication.
2. "Data communication and networking", Forouzan, TMH 4th edition
3. "Computer Communications & Networking Technologies" Michael A. Gallo & William M. Hancock Cengage Pearson publications

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LIST OF EXPERIMENTS

1. Study of Different Types of Network Equipment's.
2. Color coding standard of CAT 5, 6, 7 and crimping of cable in RJ-45.
3. LAN installations and Configurations.
4. Study of basic network command and Network configuration commands.
5. Study of network IP.
6. Write a program to implement various types of error correcting techniques.
7. Write a program to implement various types of farming methods.
8. Study of Tool Command Language (TCL).
9. Study and Installation of Standard Network Simulator: N.S-2.
10. Implement & simulate various types of routing algorithm.
11. Study & Installation of ONE (Opportunistic Network Environment) Simulator for High Mobility Networks.
12. Simulate STOP AND WAIT Protocols on NS-2.
13. Simulate various Routing Protocol on NS-2.
14. Simulate various Network Topologies on NS-2.
15. Configuring routers, bridges and switches and gateway on NS-2.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT604	UG	OBJECT ORIENTED ANALYSIS & DESIGN	60	20	20	30	20	3	1	2	5

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

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COURSE OBJECTIVES:

1. To learn the concept of Object Oriented Software Development Process
2. To get acquainted with UML Diagrams
3. To understand Object Oriented Analysis Processes

COURSE OUTCOMES:

1. Understand Object Oriented Software Development Process
2. Gain exposure to Object Oriented Methodologies & UML Diagrams
3. To apply Object Oriented Analysis Processes for projects

SYLLABUS

UNIT-I

Introduction: About Object Oriented Technology, Development and OO Modeling History. Modeling Concepts: Modeling design Technique, Three models, Class Model, State model and Interaction model.

UNIT-II

Class Modeling: Object and class concepts, link and association, Generalization and Inheritance, Advanced class modeling- aggregation, Abstract class metadata, constraints. State Modeling: Event, state, Transition and conditions, state diagram, state diagram behavior, concurrency, Relation Of Class and State models. Interaction Modeling: Use case Models, sequence models, activity models

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SEMESTER V

UNIT-III

Analysis and Design: Development Life cycle, Development stages, Domain Analysis-Domain class model, domain state model, domain interaction model, Iterating and analysis. Application Interaction model, Application class model, Application state Model, Adding operation.

UNIT-IV

System Design: Estimating Performance, Making a reuse plan, breaking system into subsystems identifying concurrency, allocation of subsystems, management of data storage, Handling Global resources, choosing a software control strategy, Handling boundary condition, common Architectural style.

UNIT-V

Class design: Overview of class design, designing algorithms recursing downward, refactoring, design optimization, Adjustment of Inheritance, Rectification of Behavior.

TEXT BOOKS:

1. Michael Blaha and J. Rumbaugh, "Object oriented Modeling and design with UML", Pearson Education

REFERENCES:

1. Satzinger, Jackson and Burd, "Object oriented Analysis and design with the Unified Process", CENGAGE Learning.
2. O'Docherty, "Object Oriented Analysis and Design Understanding, System Development with UML2.0", Wiley India.

LIST OF EXPERIMENTS

1. How to write a Problem Statement
2. Perform the system analysis: Requirement analysis, SRS.
3. Perform the function oriented diagram: DFD and Structured chart.
4. Perform the user's view analysis: Use case diagram.
5. Draw the structural view diagram: Class diagram, object diagram.
6. Draw the behavioral view diagram: Sequence diagram, Collaboration diagram.
7. Draw the behavioral view diagram: State-chart diagram, Activity diagram.
8. Draw the implementation view diagram: Component diagram.
9. Draw the environmental view diagram: Deployment diagram.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT511	UG	WIRELESS COMMUNICATION NETWORK	60	20	20	30	20	3	1	2	5

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 OBJECTIVES:

The student will have ability to:

1. Understand the fundamental of wireless communication system.
2. Describes radio propagation models and wireless channel effects.
3. Knows fundamental concept of cellular radio concepts.
4. Explains various wireless communication network systems, standards and applications.

COURSE OUTCOMES:

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

1. Demonstrates wireless communication systems design and working.
2. Investigate various advanced techniques for wireless communications.
3. Constructs design architectures for different Wireless Systems.
4. Evaluates the emerging trends in Wireless communication.

SYLLABUS

UNIT-I

Introduction to Wireless Communication System: Evolution of mobile communications, MobileRadio System around the world, Types of Wireless communication System, Comparison of Common wireless system, Trend in Cellular radio and personal communication. Second generation Cellular Networks, Third Generation (3G) Wireless Networks ,Wireless Local Loop(WLL),Wireless Local Area network(WLAN),

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UNIT-II

The Cellular Concept- System Design Fundamentals: Cellular system, Hexagonal geometry cell and concept of frequency reuse, Channel Assignment Strategies Distance to frequency reuse ratio, Channel & co-channel interference reduction factor, S/I ratio consideration and calculation for Minimum Co-channel and adjacent interference, Hand off Strategies, Umbrella Cell Concept, Trunking and Grade of Service, Improving Coverage & Capacity in Cellular System-cell splitting, Cell sectorization, Repeaters, Micro cell zone concept, Channel antenna system design considerations.

UNIT-III

Mobile Radio Propagation Model, Small Scale Fading and diversity: Large scale path loss:- Free Space Propagation loss equation, Path-loss of NLOS and LOS systems, Reflection, Ray ground reflection model, Diffraction, Scattering, Link budget design, Max. Distance Coverage formula, Empirical formula for path loss, Indoor and outdoor propagation models, Small scale multipath propagation, Impulse model for multipath channel, Delay spread, Feher's delay spread, Types of small scale Fading, Rayleigh and rician distribution.

UNIT-IV

Multiple Access Techniques: Introduction, Comparisons of multiple Access Strategies TDMA, CDMA, FDMA, OFDM, CSMA Protocols.

Mobile Network And Transport Layers : Mobile IP , Dynamic Host Configuration Protocol, Mobile Ad Hoc Routing Protocols, Multicast routing, TCP over Wireless Networks , Indirect TCP , Snooping TCP , Mobile TCP . Wireless Systems: GSM system architecture, Radio interface, Protocols, Localization and calling, Handover, Authentication and security in GSM, GSM speech coding, Concept of spread spectrum, CDMA forward channels, CDMA reverse channels, Soft handoff, CDMA features, Power control in CDMA, Performance of CDMA System, GPRS system architecture.

UNIT-V

Introduction to Wi-Fi, WiMAX, Zig-Bee Networks, Software Defined Radio, UWB Radio, Wireless Adhoc Network and Mobile Portability, Security issues and challenges in a Wireless network. Application Layer : WAP Model, Mobile Location based services , WAP Gateway , WAP protocols wireless bearers for WAP , WML , WMLScripts.

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TEXT BOOKS:

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education,
2. William Stallings, "Wireless Communications and Networks", Pearson Education.
3. William D Stanley : Network Analysis with Applications, Pearson Education.
4. RoyChoudhary D: Network and systems, New Age Publication.
5. Wireless Communication, Theodore S. Rappaport, Prentice hall

REFERENCES:

1. KavehPahlavan, PrasanthKrishnamoorthy, "Principles of Wireless Networks", First Edition, Pearson Education, 200UNIT III.
2. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 200UNIT III.
3. C.K.Toh, "AdHoc Mobile Wireless Networks", First Edition, Pearson Education, 2002.
4. Wireless digital communication, KamiloFeher, PH.

LIST OF EXPERIMENTS:

1. Implementation of Link state routing algorithm.
2. Implementation of data encryption and decryption.
3. Implementation of VoIP using OPNET network simulator.
4. Install Network Simulator 2 and study network topologies.
5. Write a Program for Free space Propagation Model & Frequency Selective Fading Model
6. Write a Program for Ground Reflection (Two-ray) Model.

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BTIT512	UG	INFORMATION THEORY AND CODING	60	20	20	30	20	3	1	2	5

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

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COURSE OBJECTIVES:

1. Students will be introduced to calculate entropy, channel capacity, bit error rate, code rate, and steady-state probability.
2. Students will be introduced to convolutional and block codes, decoding techniques.
3. Students will understand how error control coding techniques are applied in communication systems.
4. Students will be able to describe the real life applications based on fundamental theory.
5. Students will implement the encoder and decoder of one block code using any programming language.

COURSE OUTCOMES:

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

1. Derive equations for entropy mutual information and channel capacity for all types of channels.
2. Distinguish between different types error correcting codes based on probability of error and bit Energy to noise ratio.
3. Design a digital communication system by selecting an appropriate error correcting codes for a particular application.
4. Explain various methods of generating and detecting different types of error correcting codes.
5. Formulate the basic equations of linear block codes.
6. Compare the performance of digital communication system by evaluating the probability of error for different error correcting codes

SYLLABUS

UNIT-I

Information Theory, Probability and Channel: Introduction, Information Measures, Review probability theory, Random variables, Processes, Mutual Information, Entropy, Uncertainty, Shannon's theorem,

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SEMESTER V

redundancy, Huffman Coding, Discrete random Variable. Gaussian random variables, Bounds on tail probabilities.

UNIT-II

Stochastic Processes: Statistical independence, Bernoulli Process, Poisson Process, Renewal Process, Random Incidence, Markov Modulated Bernoulli Process, Irreducible Finite Chains with A periodic States, Discrete-Time Birth-Death Processes, Markov property, Finite Markov Chains, Continuous time Markov chain, Hidden Markov Model.

UNIT-III

Error Control Coding: Channel Coding: Linear Block Codes: Introduction, Matrix description, Decoding, Equivalent codes, Parity check matrix, Syndrome decoding, Perfect codes Hamming Codes, Optimal linear codes. Maximum distance separable (MDS) codes. Cyclic Codes: Introduction, generation, Polynomials, division algorithm, Matrix description of cyclic codes, burst error correction, Fire Codes, Golay Codes, and CRC Codes..

UNIT-IV

BCH Codes: Introduction, Primitive elements, Minimal polynomials, Generator Polynomials in terms of Minimal Polynomials, Decoding of BCH codes. Advance Coding Techniques: Reed-Solomon codes, space time codes, concatenated codes, turbo coding and LDPC codes, Nested Codes, block. Techniques for constructing more complex convolution codes with both soft and hard decoding

UNIT-V

Convolutional channel coding: Introduction, Linear convolutional codes, Transfer function representation & distance properties, Decoding convolutional codes(Soft-decision MLSE, Hard-decision MLSE),The Viterbi algorithm for MLSE, Performance of convolutional code decoders, Soft & Hard decision decoding performance, Viterbi algorithm implementation issues: RSSE, trellis truncation, cost normalization, Sequential decoding: Stack, Fano, feedback decision decoding, .

TEXT BOOKS:

1. Rajan Bose “Information Theory, Coding and Cryptography”, TMH, 2002.
2. Kishor S. Trivedi “Probability and Statistics with Reliability, Queuing and Computer Science Applications”, Wiley India, Second Edition.
3. J.C.Moreira, P.G. Farrell “Essentials of Error-Control Coding”, Willey Student Edition
4. San Ling and Chaoping “Coding Theory: A first Course”, Cambridge University Press, 2004.
5. G A Jones J M Jones, “Information and Coding Theory”, Springer Verlag, 2004.

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SEMESTER V

REFERENCES:

1. Cole, "Network Security", Bible, Wiley INDIA, Second Addition
2. Proakis and Masoud, "Digital Communication", McGraw-Hill, 2008.
3. Principles of Digital Communications, Signal representation, Detection, Estimation & Information
4. Coding by J Das, S.K. Mullick, P.K. Chatterjee, New Age Int. Ltd.
5. Principles of Communication Systems, Taub & Schilling, 2/e, TMH Publishers

LIST OF EXPERIMENTS:

1. Write a program for determination of various entropies and mutual information of a given channel. Test various types of channel such as a) Noise free channel. b) Error free channel c) Binary symmetric channel d) Noisy channel. Compare channel capacity of above channels.
2. Write a program for generation and evaluation of variable length source coding using C/MATLAB
 - a) Shannon – Fano coding and decoding
 - b) Huffman Coding and decoding
 - c) Lempel Ziv Coding and decoding
3. Write a Program for coding & decoding of Linear block codes.
4. Write a Program for coding & decoding of Cyclic codes.
5. Write a program for coding and decoding of convolution codes.
6. Write a program for coding and decoding of BCH and RS codes.
7. Write a program to study performance of a coded and uncoded communication system (Calculate the error probability).
8. Write a simulation program to implement source coding and channel coding for transmitting a text file.
9. Encoding the data bits using a Binary Cyclic block encoder in Simulink.
10. Decoding the code words using a Binary Cyclic block decoder in Simulink.
11. Encoding the data bits using a Binary Linear block encoder in Simulink.
12. Decoding the code words using Binary Linear block decoder in Simulink.

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SEMESTER V

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT513	UG	MANAGEMENT INFORMATION SYSTEM	60	20	20	30	20	3	1	2	5

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 OBJECTIVES:

1. Understand types of MIS applications in organizations
2. Discuss the development of management information systems in organizations.
3. Select and design MIS systems appropriate to meet management requirements.
4. Critically evaluate MIS contributions to the strategic management of organizations

COURSE OUTCOMES:

1. To understand MIS in both the wider managerial context and in the narrower confines of the selection, support, design and development of computer applications
2. To focus on the concepts a manager needs to understand, in order to make effective use of, computerized information systems

SYLLABUS

UNIT-I

Organizations and Computing: Introduction, Modern Organization-IT enabled- Networked- Dispersed- Knowledge Organization, Information Systems in Organizations- what are information systems?, Brief history of computing- ENIAC: Way to commercial computers- Advent of artificial intelligence- advent of personal computing-Free Software Movement- Advent of Internet, The role of internet- Internet and Web: they are different-the internet changes everything

UNIT-II

Managing Information Systems in Organizations: Introduction, Managing in the InternetEra, Managing Information Systems in Organization-the IT interaction model, Challenges for the manager-

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what information to build?-how much to spend on information systems?-what level of capabilities should be created with information systems?-how centralized should the services be?-what security levels are required?-what is technology road map for the organization?

UNIT-III

Data and Information: Introduction, data and information- measuring data, information as a resource, information in organizational functions, types of information technology, types of information systems-transaction processing systems-management information system.

UNIT-IV

Decision making and communication: Introduction, Decision making with MIS-Tactical decisions-operational decisions-strategic decisions, communication in organizations- types of communication-examples of communications in organizations- decision making with communication technology

UNIT-V

Strategy: Introduction, Information goods-properties-technology lock-in and switching costs-network externalities-positive feedback-tippy markets, information systems and competitive strategy- value chain, the Role of CIO-information system's plan-vendor coordination-technology updates-return on investment on technology.

TEXT BOOKS:

1. Kenneth C. Laudon & Jane P. Laudon, Essentials of Management Information Systems, Tenth Edition, Pearson Prentice, Hall, 2012
2. Terry Lucey, Management Information Systems, Ninth Edition, 2005, Thompson

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS514	UG	DATA WAREHOUSE & MINING	60	20	20	30	20	3	1	2	5

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 OBJECTIVES

The student will have ability to:

1. To understand the basic principles, concepts and applications of data mining.
2. To identify and implement several methods to enhance and develop information systems and to manage the information system resources.
3. To develop skills of using recent data mining software for solving practical problems.
4. To gain experience of doing independent study and research.

COURSE OUTCOMES

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

1. Show how to plan, acquire, and maintain information systems using data mining techniques.
2. Identify components in typical data mining architecture.
3. Understand typical knowledge discovery process and the different algorithms available by popular commercial data mining software.
4. Obtain hands-on experience with some popular data mining software.

SYLLABUS

UNIT-I

Data warehousing Components –Building a Data warehouse – Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata.

UNIT-II

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP

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SEMESTER V

Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools– OLAP Tools and the Internet.

UNIT-III

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns, Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse Issues Data Preprocessing.

UNIT-IV

Mining Frequent Patterns, Associations and Correlations Mining Methods Mining Various Kinds of Association Rules Correlation Analysis Constraint Based Association Mining Classification and Prediction - Basic Concepts - Decision Tree Induction Bayesian Classification Rule Based Classification – Classification by Back propagation, Support Vector Machines Associative Classification – Lazy Learners – Other Classification Methods - Prediction

UNIT-V

Cluster Analysis - Types of Data Categorization of Major Clustering Methods, K-means Partitioning Methods, Hierarchical Methods-Density-Based Methods-Grid Based Methods, Model-Based Clustering Methods – Clustering High Dimensional Data- Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

TEXT BOOKS:

1. Alex Berson and Stephen J. Smith, “Data Warehousing, Data Mining & OLAP”, TataMcGraw Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and MichelineKamber, “Data Mining Concepts and Techniques”, Second Edition, Elsevier, 2007.

REFERENCES:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, “Introduction to Data Mining”, Person Education, 2007.
2. K.P.Soman, ShyamDiwakar and V.Ajay “Insight into Data Mining Theory and Practice”, Easter Economy Edition, Prentice Hall of India, 2006.
3. G.K.Gupta, “Introduction to Data Mining with Case Studies”, Easter Economy Edition, Prentice Hall of India, 2006.
4. Daniel T.Larose, “Data Mining Methods and Models”, Wile-Interscience, 2006.

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LIST OF EXPERIMENTS:

1. Installation of any data mining tool.
2. Demonstration of preprocessing on dataset.
3. Demonstration of association rule mining process on dataset.
4. Demonstration of classification rule process on dataset
5. Demonstration of clustering rule process on dataset.
6. Evaluate attribute relevance analysis on a weather data warehouse
7. Evaluate Information Gain of an attribute in the student database
8. Experiment to predict the class using the Bayesian classification

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT506	UG	LINUX ADMINISTRATION 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 OBJECTIVES:

The student will have:

1. To Learn the UNIX/Linux operating system, including: task scheduling and management.
2. To Learn memory management, input/output processing, internal and external commands,
3. To Learn shell configuration, and shell customization.
4. To Learn and explores the use of operating system utilities such as text editors.
5. To Learn electronic mail, file management, scripting, and C/C++ compilers.

COURSE OUTCOMES:

Upon completion of the subject, students will be able:

1. To Identify and use UNIX/Linux utilities to create and manage simple file processing operations,
2. To organize directory structures with appropriate security.
3. To effectively use the UNIX/Linux system.
4. To Monitor system performance and learn the shell scripts.
5. To use the shell scripts in designing a programs for engineering problems.

SYLLABUS

UNIT-I

Overview of Unix/Linux:- What is UNIX,Files and processes, directory Structure Starting an UNIX terminal Listing files and directories Making Directories Changing to a different Directory the directories . and .. Pathnames More about home directories and pathnames Copying Files Moving Files Removing Files and directories Displaying the contents of a file on the screen Searching the contents of a file redirection redirecting the Output redirecting the Input Pipes Wildcards Filename Conventions Getting Help Changing access rights Processes and Jobs Listing suspended and background processes Killing a process.

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UNIT-II

File System: - Users and groups, the 'root' user or superuser, changing file ownership (chown) changing file group ownership (chgrp), Permissions on files, Permissions on directories, How permissions are applied, Changing permissions (chmod), unified UNIX file system, special file types Symbolic links (ln -s) Inodes and directory entries, Hard links, Preserving links while copying and archiving.

UNIT-III

Process Control: - Processes description, properties of a process, Parent processes and child processes, Killing processes and sending signals to a process (kill, killall, xkill) Viewing a Process, Command to display Process, Process Attributes, Process States, Process Fields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, Scheduling Process, Scheduling Priorities, Changing the Priority of a time-sharing process.

UNIT-IV

System Security: - Auditing source code, Securing SSH, security alerts, Open mail relays, Installing Intrusion Detection Systems, Port scanning with nmap, Firewall using IP Tables, Filter and NAT Rules, SMTP Overview and Implementations, connections and Relays, Security Considerations ,Activating and Interfacing with SELinux , SELinux commands and Roles, Location & Access ,Boot level security (GRUB).

UNIT-V

Basic Shell Scripting:-Types of shells Shell functionality Environment Writing first script Writing script & executing basic script Debugging script Making interactive scripts Variables (default variables) Mathematical expressions Conditional statements If-else-elif Test command Logical operators-AND,OR,NOT use -esac Loops While For Until Break & continue Command line arguments Positional parameters Set & shift IFS Break & continue Functions & file manipulations Processing file line by line Functions.

TEXT BOOKS:

1. Yashavant P. Kanetkar "Unix Shell Programming", BPB Publications
2. Venkatesh Murthy, "Introduction to Unix & Shell", Pearson Edu
3. Forouzan, "Unix & Shell Programming", Cengage Learning
4. SumitabDas, "Unix Concept & Application", TMH

REFERENCES:

1. Venkateshwavle, "Linux Programming Tools Unveil'ed", BS Publication.
2. Richard Peterson, "Linux Complete Reference", TMH
3. Richard Peterson, "Unix Complete Reference", TMH

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SEMESTER V

LIST OF EXPERIMENTS:

- 1) Execution of various file/directory handling commands.
- 2) Simple shell script for basic arithmetic and logical calculations.
- 3) Shell scripts to check various attributes of files and directories.
- 4) Shell scripts to perform various operations on given strings.
- 5) Shell scripts to explore system variables such as PATH, HOME etc.
- 6) Shell scripts to check and list attributes of processes.
- 7) Execution of various system administrative commands.
- 8) Use sed instruction to process /etc/passwd file.
- 9) Write a shell script to display list of users currently logged in.
- 10) Write a shell script to delete all the temporary files.
- 11) Write a shell script to search an element from an array using binary searching.
- 12) Write script to print the message "Hello" on the Console.
- 13) Write script to perform following basic math operation as :
 - a) Addition
 - b) Subtraction
 - c) Multiplication
 - d) DivisionNote: i) Take input from keyboard
ii) Take input as command line parameter
- 14) Write script to display current date, time, username and current directory.
- 15) Write shell script to show various system configurations like:
 - a) Currently logged user and his long name
 - b) Current shell
 - c) Your home directory
 - d) Your operating system type

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS407	UG	PROGRAMMING WITH PYTHON	0	0	0	0	50	0	0	4	2

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 OBJECTIVES :

The student will have ability to:

1. To develop proficiency in creating based applications using the Python Programming Language.
2. To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
3. To be able to do testing and debugging of code written in Python.
4. To be able to draw various kinds of plots using PyLab.
5. To be able to use generators for generating series like fibonacci.

COURSE OUTCOMES:

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

1. Ability to create robust applications using the Python programming language.
2. Ability to test and debug applications written using the Python programming language.
3. Ability to create applications for solving computational problems using the Python
4. Programming Language.

SYLLABUS

UNIT I

INTRODUCTION Core Python , Introduction to Python ,Python basic Operators , History of python , Features ,Installation and Working with Python , Setting up path ,Working with Python , Basic Syntax , Variable and Data Types , Operator , Understanding python blocks .

Python Data Types : Declaring and using Numeric data types:int, float, complex , Using string data type and string operations , Defining list and list slicing ,Use of Tuple data type , Building blocks of python programs , Understanding string in build methods , List manipulation using in build methods ,

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Dictionary manipulation , Programming using string, list and dictionary in build functions, Properties , Accessing values in dictionaries , Working with dictionaries .

Python Program Flow Control : Conditional blocks using if, else and elif , Simple for loops in python , For loop using ranges, string, list and dictionaries , Use of while loops in python , Loop manipulation using pass, continue, break and else , Programming using Python conditional and loops block

UNIT II

Python Functions, Modules and Packages: Organizing python codes using functions , Defining a function , Calling a function , Types of functions , Function Arguments , Anonymous functions , Global and local variables , Organizing python projects into modules , Importing own module as well as external modules , Understanding Packages , Powerful Lamda function in python ,Programming using functions, modules and external packages.

Python File Operation : Reading config files in python , Writing log files in python , Understanding read functions, read(), readline() and readlines() , Understanding write functions, write() and writelines() , Manipulating file pointer using seek ,Programming using file operations

Modules: Importing module ,Math module , Random module , Packages ,Composition

Input-Output: Printing on screen ,Reading data from keyboard ,Opening and closing file , Reading and writing files ,Functions.

UNIT III

Exception Handling, Exception, Exception Handling, Except clause , Try ? Finally clause, User Defined Exceptions, OOPs concept.

UNIT IV

ADVANCE PYTHON, **Class and object** , Attributes ,Inheritance ,Overloading , Overriding ,Data hiding.

Regular expressions: Match function, Search function, Matching VS Searching, Modifiers , Patterns
CGI: Introduction, Architecture, CGI environment variable ,GET and POST methods ,Cookies , File upload

UNIT V

Introduction of Database , Introduction ,Connections ,Executing queries ,Transactions ,Handling error Networking , Socket , Socket Module , Methods , Client and server , Internet modules

Multithreading: Thread, Starting a thread, Threading module, Synchronizing threads, Multithreaded Priority GUI Programming: Introduction, Tkinter programming

TEXT BOOKS:

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1. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. Allen Downey, Jeffrey Elkner and Chris Meyers "How to think like a Computer Scientist, Learning with Python", Green Tea Press.
3. Mark Lutz "Learning Python" O'Reilly Media; 5 edition.
4. David Beazley "Python Cookbook, Third edition" O'Reilly Media

REFERENCES:

1. Python Essential Reference, 4th Edition Addison-Wesley Professional.
2. Mark Lutz "Programming Python: Powerful Object-Oriented Programming "David Beazley
3. "Python Cookbook" Third edition, O'Reilly Media

LIST OF EXPERIMENTS:

1. Write a Python Program to Print Hello world!
2. Write a Program to Add Two Numbers.
3. Write a Program to Find the Square Root.
4. Write a Program to Calculate the Area of a Triangle.
5. Write a Program to Solve Quadratic Equation.
6. Write a Program to Swap Two Variables.
7. Write a Program to Generate a Random Number.
8. Write a Program to Convert Kilometers to Miles.
9. Write a Program to Convert Celsius To Fahrenheit.
10. Write a Program to check if a number is positive, negative or zero.
11. Write a Program to Check if a Number is Odd or Even.
12. Write a Program to Check Leap Year.
13. Write a Program to Find the Largest Among Three Numbers.
14. Write a Program to Check Prime Number.
15. Write a Program to Print all Prime Numbers in an Interval.
16. Write a Program to Find the Factorial of a Number.
17. Write a Program to Display the multiplication Table.
18. Write a Program to Print the Fibonacci sequence.
19. Write an English sentence with understandable semantics but incorrect syntax. Write another
20. English sentence which has correct syntax but has semantic errors.
21. Create a program that prompts the user for a number of gallons of gasoline. Reprint that value alongwith its conversion equivalent number of liters.
22. Write a program that allows a user to enter his or her two favorite foods. The program should thenprint out the name of a new food by joining the original food names together.
23. Write a Tipper program where the user enters a restaurant bill total. The program should then display two amounts: a 15 percent tip and a 20 percent tip.

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24. Write a Car Salesman program where the user enters the base price of a car. The program should add on a bunch of extra fees such as tax, license, dealer prep, and destination charge. Make tax and license a percent of the base price. The other fees should be set values. Display the actual price of the car once all the extras are applied.
25. Create a program with a function that calculates the area of a circle by taking a radius from the user.
26. Write your own sum function called mySum that takes a list as a parameter and returns the accumulated sum.

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