

Department of Information Technology

School of Engineering & Technology

Central University of Kashmir



Syllabus for M. Tech

Meeting of School Board of Engineering 24, 12, 2016

Semester III

Central University of Kashmir

Semester III

| S. No. | Course Code | Course Title | Type | Credits | Evaluation | | |
|--------|-------------|------------------------------------|------|---------|------------|-----|-------|
| | | | | | CIA | ESE | Total |
| 1 | MTIT C 301 | Advanced Software Engineering | C | 4 | 40 | 60 | 100 |
| 2 | MTIT C 302 | Wireless Communication | C | 4 | 40 | 60 | 100 |
| 3 | MTIT C 303 | Network Security | C | 4 | 40 | 60 | 100 |
| 5 | MTIT C 304 | Research Project Phase I (Seminar) | C | 2 | 50 | - | 50 |
| 6 | MTIT C 305 | Research Methodologies | C | 2 | 20 | 30 | 50 |
| 4 | MTIT E --- | Elective III | E | 4 | 40 | 60 | 100 |
| 7 | | Open Generic Elective (OGE) | E | 4 | 40 | 60 | 100 |
| | | Total | | 24 | | | 600 |

Elective III

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|--|--|
| 1. MTIT E 310: Compiler Design 2. MTIT E 311: Natural Language Processing 3. MTIT E 312: Multimedia Technologies 4. MTIT E 313: Machine Learning 5. MTIT E 314: Optimization Techniques 6. MTIT E 315:VLSI 7. MTIT E 316:Software Project Management | 8. MTIT E 317:Expert Systems 9. MTIT E 318: Advanced Java & Android Programming 10. MTIT E 319: Computer Graphics 11. MTIT E 320: Embedded Systems 12. MTIT E 321: Elective on Special Topics 13. MTIT E 322: Cloud Computing |
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MTIT C 301: Advanced Software Engineering

Unit I

Introduction to Software Engineering Concepts, System Life Cycle, Software Product: Software development paradigms, Development Activities, Managing Software Development, Project Organization. COCOMO Model, Software Equation, Project Scheduling and Tracking.

Unit II

Analysis Requirement Elicitation and Characteristic, (SRS), Use Case, Unified Modelling Languages, Software prototyping. DFD, ER- Diagrams. Data Dictionary (DD), Analysis object Model(Domain Model)/Dynamic Model, Non-Functional Requirements, Analysis Patterns, Data flow analysis, Control flow analysis.

Unit III

System Design: Overview, Concepts and Activities. Addressing Design Goals, Managing System Design. Effective modular design, Cohesion & Coupling. Decomposing the System. Software Quality Assurance (SQA), Process and Product Quality, Capability Maturity Model (CMM). Software Quality Assurance: Need and Reliability Measures.

Unit IV

Testing: Objectives, need & Advantages, Levels of Testing, Testing lifecycle, Test Cases. Configuration Management, Project Management _(Cyclometric Analysis). Feature of modern GUI, Real time interface design. Implementation and Managing change, Programming language and Coding, Human Computer Interaction, Reusing Pattern Solution, Specifying Interface.

Unit V

Concern, Separation of Concerns, Cross-Cutting concerns, Theme Approach. Aspect Oriented Software Development, AO Design Principle, Trait (Computer programming), Aspect Oriented programming, Subject Oriented programming. Aspect Oriented Programming Using Aspect-J.

References

1. Bernd Bruegge, Alan H.Dutiot, Object –Oriented Software Engineering, Pearson Education.
2. Robert E. Filman, TzillaElrad, Siobhan Clarke, and Mehmet Aksit, Aspect-Oriented Software Development. Addison-Wesley.
3. R. Pressman, Software Engineering: A Practioner’s approach, McGraw Hill.
4. I. Sommerville, “Software Engineering,9th ed.” Addison Wesley Professional.
5. Stephen R. Schach, Object Oriented Software Engineering, McGraw-Hill.

MTIT C 302: Wireless Communication

UNIT I: SERVICES AND TECHNICAL CHALLENGES

Types of Services, Requirements for the services, Multipath propagation, Spectrum Limitations, Noise and Interference limited systems, Principles of Cellular networks, Milestones in wireless communication R&D

UNIT II: WIRELESS PROPAGATION CHANNELS

Propagation Mechanisms (Qualitative treatment), and its effects on mobile communication: Free space attenuation, Reflection and Transmission, Diffraction, Scattering by surfaces. Channel Classification, Narrowband and Wideband models.

UNIT III: WIRELESS TRANSCEIVERS

Structure of a wireless communication link, Modulation and demodulation – Quadrature Phase Shift Keying, $\pi/4$ -Differential Quadrature Phase Shift Keying, Offset-Quadrature Phase Shift Keying, Binary Frequency Shift Keying.

UNIT IV: SIGNAL PROCESSING IN WIRELESS SYSTEMS

Principle of Diversity, Macrodiversity, Microdiversity, Signal Combining Techniques, Transmit diversity, Equalisers- Linear and Decision Feedback equalisers, Review of Channel coding and Speech coding techniques.

UNIT V: ADVANCED TRANSCEIVER SCHEMES

Spread Spectrum Systems- Cellular Code Division Multiple Access Systems- Principle, Power control, Effects of multipath propagation on Code Division Multiple Access, Orthogonal Frequency Division Multiplexing . Antennas: Introduction, Antennas for Mobile Stations, Antennas for Base Stations

REFERENCES

1. Andreas.F. Molisch, “Wireless Communications”, John Wiley – India, 2006.
2. Simon Haykin & Michael Moher, “Modern Wireless Communications”, Pearson Education, 2007.
3. Rappaport. T.S., “Wireless communications”, Pearson Education, 2003.
4. Gordon L. Stuber, “Principles of Mobile Communication”, Springer International Ltd., 2001.

MTIT C 303: Network Security

UNIT-I:

Security: Introduction, Concepts, Threats and Risks, Attacks and its types, Security Services, Mechanisms. Malicious Software: Viruses, Worms, Trojan, spyware, Access Control: Introduction, Models (Bell-LaPadula, Biba Integrity Models), Role Based Models.

UNIT-II:

Number theory : Basic Concepts, Divisibility Algorithm, Groups, Rings ,Field , Finite Field($GF(P)$ & $GF(2^n)$) , prime numbers (Fermat's & Euler's Theorem) Cryptography: Symmetric Cryptography: Symmetric Ciphers Models, Block Ciphers :DES, AES, Symmetric Cipher Modes, Stream Ciphers: RC4

UNIT-III:

Asymmetric cryptography: RSA. Deffie Hellman key exchange Message Authentication: MD5 and SHA 512, Digital Signatures, Digital Signature Standard, Public Key Infrastructure (PKI): Key Management and Distribution, Kerberos protocol.

UNIT-IV:

Web security Consideration: Secured Socket Layer and Transport layer security, Secured Electronic Transaction (SET) and Secured Mail: Pretty Good Privacy (PGP), S/MIME, Network Attacks: Buffer Overflow, IP Spoofing, TCP Session Hijacking, Sequence Guessing, DNS Cache poisoning, IPSec, VPN.

UNIT-V:

Network Defence tools: Intrusion Detection and Prevention system, Firewall: Types of Firewalls: Packet Filtering Router, Stateful Inspection Firewall, Application Level Gateway or Proxy, Circuit level gateway, Bastion Host Firewall Configuration: Screened Host Firewall System, Screened Subnet Firewall System. Mobile platform Security Model (Android and IOS), Mobile Threats and Malware.

References:

1. Network Security Essentials ,William Stallings, Prentice-Hall.
2. Fundamentals of Computer Security Technology, Edward Amoroso, Prentice-Hall.
3. Cryptography and Data Security ,Dorothy E. Denning, Addison-Wesley.
4. Computers under Attack ,Peter J. Denning, Addison-Wesley.
5. Cryptography: Theory and Practice ,Douglas R. Stinson, CRC Press.
6. Computer Crime and Computer Forensics, Dr. R.K.Tiwari,P.K.Sastri,K.V.Ravikumar, First Edition, 2002, Select Publishers
7. Computer Security Gollmann, Dieter, First Edition, 1999, John Wiley & Sons Ltd.

MTIT C 305: Research Methodologies

Unit I

Introduction to Scientific Research, Meaning, Objectives and Significance of Research Motivation in Research, Types of research approaches, Quantitative research methods, Research methods versus methodology, Research process, Criteria of good research, Research problems, Necessity of defining the problem, Technique involved in defining the problem, Design and Development Research Methods, Meaning of research design, Need for research design, Features of a good design, Different research designs, Basic principles of experimental designs, literature survey for research work, arriving at directions of research, Formulation of research title, development of criteria based research proposal

Unit II:

Root Finding: Bisection Method, False Position Method, Secant Method, Interpolation: Newtons forward method, Newtons backward method and Lagrangian Interpolation.

A brief history of python, Installing python, Basic Python Syntax: String operations, The format method, String Slices, String operators, Numeric Data types, Conversions, Simple Input and Output, Control flow and syntax, Loops, Collections ,Lists, Tuples , Sets, Dictionaries.

Unit III

Scientific Writing : Significance of report writing, Structure and Components of Research Report, Types of Report: research papers, thesis, Research Project Reports, Precautions for writing research reports, Pictures and Graphs, Citation Styles, Oral presentation,

Technical writing using LaTeX: Installation, MikTeX, TeXnicCenter, Creating reports and articles, Text environment, Math environment, Figures, Tables, BibTeX - reference manager, Camera Ready Preparation.

References

1. C.R. Kothari, Research Methodology Methods & Techniques, 2nd Edition, Wishwa Prakashan Publishers.
2. B.L. Garg, R. Karadia, Aggarwal. An introduction to Research methodology, RBSA publishers.
3. Donald H.Mc Burney, Research Methods, Thomas learning.
4. Donald R. Cooper, Pamela S. Schinder, Business Research Methods, 8/e, Tata MC graw-Hill Co.ltd., 2006
5. Misra R.P, Research Methodology – A Hand Book, Concept publishing Company, New Delhi
6. Leslie Lamport, LaTeX: A Document Preparation System, Second Edition.

Semester III

Electives

Compiler Design

Unit I

Introduction to Compiling- Compilers-Analysis of the source program-The phases- Cousins- The grouping of phases-Compiler construction tools. The role of the lexical analyzer- Input bufferingSpecification of tokens-Recognition of tokens-A language for specifying lexical analyzer.

Unit II

Syntax Analysis- The role of the parser-Context-free grammars-Writing a grammar-Topdown parsingBottom-up Parsing-LR parsers-Constructing an SLR(1) parsing table. Type checking, Type SystemsSpecification of a simple type checker.Run-Time Environments-Source language issues-Storage organization-Storage-allocation strategies.

Unit III

Intermediate languages-Declarations-Assignment statements - Boolean expressions- Case statementsBackpatching-Procedure calls

Unit IV

Issues in the design of a code generator- The target machine-Run-time storage management- Basic blocks and flow graphs- Next-use information-A simple codegenerator-Register allocation and assignment-The dag representation of basic blocks - Generating code from DAG.

Unit V

Introduction-The principle sources of optimization-Peephole optimization- Optimization of basic blocks Loops in flow graphs- Introduction to global data-flow analysis-Code improving transformations.

References:

1. Compilers- Principles, Techniques, and Tools”,Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, , Pearson Education Asia,
2. Modern Compiler Design,DavidGalles, Pearson Education Asia.
3. Advanced Compiler Design &Implementation, Steven S. Muchnick,Morgan Kaufmann Pulishers,.
4. Crafting a Compiler with C, C. N. Fisher and R. J. LeBlanc “, Pearson Education.
5. Modern Compiler Design, Galles, Pearson.

Natural Language Processing

Unit I

Introduction: Natural language processing- Linguistic Background, Regular Expressions and Automata, Morphology and Finite- state Transducers, Computational Phonology and Text-to- Speech, word level Morphology, Probabilistic Models of Pronunciation and spelling, N-grams, HMMs and speech Recognition.

Unit II

Grammars and Parsing: Grammars and Sentence structure, Top- Down Parser, Bottom- up chart Parser, Transition Network Grammars, Top Down chart parsing, Finite state Models and Morphological Processing Grammars and Logic Programming.

Unit III

Grammars for Natural language : Auxiliary verbs and verb phrases , Movement phenomena in language, Handling questions in context-free Grammars, Relative clauses, The Hold Mechanism in ATNs, Gap threading

Unit IV

Semantic Interpretation: Sements and logical form, Word Senses and Ambiguity, The Basic Logical form, Language, Encoding Ambiguity in the logical form, Verb & States in Logical forms Thematic Roles, Speech acts and Embedded Sentences Defining Semantic Structure: Model Theory

Unit V

Linking Syntax and Semantics: Semantic Interpretation and Compositionality, Lexicalized Semantic Interpretation and sematic roles, Semantic Interpretation Using feature Unification, Generating Sentences from Logical Form

Ambiguity Resolution: Selectional Restriction, Semantic Filtering Using Selectional Restrictions, Semantic Networks, Stastical Word Sense Disambiguation, Stastical Semantic Preferences Combining Approaches to Disambiguation

References:

1. Allen, j., Natural Language Understanding. 2Nd Edition
2. Jurafsky, D.& J .Martin.2000.Speech and language processing: An introduction to Natural language processing, Computational Linguistics, and speech Recognition.
3. Christopher D. Manning and Hinrich Schutze, Foundation of Statistical Natural Language Processing.1999.MITPress

Multimedia Technologies

Unit I

Introduction: Multimedia basics, Multimedia Information representation as Text, image, audio and video.

Unit II

Multimedia Networks, Multimedia applications, Networking terminology.

Text and image compression, compression Principles.

Unit III

Audio and Video compression, MPEG, Dolby, Coding and compression.

Standards for multimedia Communication. Digital communication, Enterprise Networks.

Unit IV

The internet and its applications, World Wide Web. Broadband ATM Networks.

Unit V

Entertainment Networks and high speed modems. Transport Protocols, Application support functions.

References:

1. Fred Halsall, Multimedia Communications Applications, Networks, protocols and standards, Pearson Education.
2. Fundamentals of Multimedia, ZE-Nian li and Mark S.Drew, Pearson Prentice Hall.
3. Image and video compression for Multimedia Engineering: Fundamentals, Algorithms, and standards, Yun Q. Shi, Huifang sun, CRC Press
4. Multimedia Communication systems, K. Rammohanrao, Z.S Bolzkovic,, D.A. Milanovic, Prentice Hall.
5. Video Processing and communications, Yao Wang Joern Ostermann and Ya-Qin Zhang, Prentice Hall.
6. Image and video compression for multimedia Engineering: Fundamentals, Algorithms, and Standards , Yun Q. Shi, Huifung sun, CRC Press.
7. Multimedia Database management systems, Springer International Edition.

Machine Learning

UNIT I

Introduction: Towards Intelligent Machines, Soft Computing/Machine Learning, Well posed machine learning problems, Data Representation, Forms of learning, Machine learning and data mining, Basic Linear Algebra in Machine learning Techniques.

UNIT II

Supervised Learning: Learning from Observations, Occam's Razor Principle and Overfitting Avoidance, Heuristic Search in Inductive Learning, Estimating Generalization errors, Metrics for Assessing Regression Accuracy, Metrics for Assessing Classification Accuracy.

UNIT III

Statistical Learning: Descriptive Statistics in Learning Techniques, Bayesian Reasoning, k-Nearest Neighbor (k-NN) Classifier, Linear Regression with Least Square Error Criterion, Logistic Regression for classification Tasks, Fisher's Linear Discriminant and Thresholding , Minimum Description Length Principle.

UNIT IV

Learning with Neural Networks: Neuron Models, Network Architecture, Perceptron's, Multi- Layer Perceptron Networks and the Error-backpropagation.

Support Vector Machines (SVM), Basic variants of SVM.

UNIT V

Unsupervised Learning: Clustering, Clustering Algorithms, Overview of basic clustering methods (k-means, Agglomerative clustering, EM algorithm), Principle Component Analysis for Attribute Reduction.

References

1. Applied Machine Learning by M. Gopal, McGraw Hill Education
2. Pattern Recognition and Machine Learning by Christopher M. Bishop.
3. Machine Learning a Probabilistic Perspective by Kevin P. Murphy

Optimization Techniques

Unit I

Introduction to Optimization: Engineering applications of Optimization, Statement of an Optimization problem, Classification of Optimization Problems, Single-Variable Optimization, Multivariable Optimization with No Constraints, Multivariable Optimization with equality Constraints, multivariable Optimization with inequality Constraints.

Linear Programming: Principles of simplex Method, Simplex method in tabular form, Duality and dual simplex method.

Unit II

Assignment and Transportation Problems: Mathematical model of assignment problem, solution methods of assignment problem: Enumeration Method, Transportation method, Hungarian method. Mathematical model of transportation problem, The transportation Algorithm, Methods of solving Transportation problems: North West corner Method, Least cost Method.

Unit III

Dynamic Programming: Introduction, Developing optimal Decision Policy, Dynamic Programming Approach for Solving Linear Programming Problems, Continuous Dynamic Programming.

Unit IV

Queuing Theory: Probability Description of arrivals and service times, Objectives and different Characteristics of queuing system .Discrete time Queuing Systems, steady state behaviour of Markovian and Eriangian Models (MM/1, MM/CM/Ek /1)

Unit V

Network Models: Scope and Definition of Network Models, Minimal spanning Tree algorithm, Shortest- Route Problem, Maximal Flow Model, CPM and PERT.

References:

1. S.S Rao, Engineering optimization: Theory & practice
2. Taha H.A “Operations Research- an Introduction”, prentice Hall of India, 2003

Software Project Management

Unit I: Conventional Software Management

The Waterfall model, Conventional Software Management Performance. Evolution of Software Economics: Software Economics, Pragmatic software cost estimation. Improving software Economics: Reducing Software size, improving software processes, improving team effectiveness, improving automation , Achieving Required Quality, peer inspections.

Unit II: Comparison of old and new

The Principles Conventional software engineering, Principles of modern software management, transitioning to an iterative process. Life cycle phases: Engineering and production stages, inception, Elaboration, Construction, transition phases.

Artifacts of the process: The artifacts sets, Management artifacts, Engineering artifacts, Programmatic artifacts. Model Based software architectures: A Management Perspective and technical Perspective.

Unit III : Flows of the process

Software process workflows, Inter trans-work-flows. Checkpoints of the process: Major Milestones, Minor Milestones, Periodic status assessments. Interactive process Planning: Work breakdown structures, Planning Guidelines, cost and schedule estimating, Interaction Planning Process, Pragmatic planning.

Unit IV: Project Organizations Responsibilities

Line-of-Business Organizations, Project Organizations, Evolution of Organizations. Process Automations: Automation Building Blocks, The project environment. Project control and process instrumentation: The server care Metrics, Management indicators, life cycle expectations pragmatic software Metrics, Metrics automation. Tailoring the process: Process discriminants.

Unit V: Future Software Project Management

Modern Project profiles Next Generation Software Economics, modern process transitions.

Case Study: The command centre processing and Display System Replacement (CCPDS-R).

References:

1. Walker Rayce: “software project management A unified Framework”, Ist Edition, Pearson Education,2005.
2. Richard H.Thayer: “Software Engineering Project Management”, 2nd Edition, IEEE Computer society,1997.
3. Shere K.D: “Software Engineering & Management”, Ist Edition,Hall,1988.

Expert Systems

Unit I :Overview introduction to rule- based expert systems

Background, general introduction. Forward and backward chaining, conflict resolution. Uses, structured selection, configuration, diagnosis and business rules

Unit II

Rule- based expert system

Uncertainty, fuzzy logic and belief nets. Expert system shells

Unit III

Other Expert system Paradigms

PIES example system (Pan and Tenenbaum) OOPs, frames, case-based reasoning and help desks, Recommendor systems (Cd Now case study). Scheduling (Steelmaking example: Dorn and Slany)

Unit IV

Building expert systems

CLUES example system (Talebzadeh, Mandutianu and Winner), Building expert systems Discussion of shells. Knowledge Management (Wiki Web case study)

Unit V

Machine Learning and data-base mining

Data Mining Decision Trees, Neural Networks, Text Mining, Web Mining current trends in AI

References:

1. The Engineering of knowledge- based system, A.J. Gonzalez and .D.Dankel, Prentice Hall, 1993.
2. A guide to expert systems, Donald A. Watermann, Pearson publications.
3. Introduction to knowledge systems, Stefik M., Morgan Kaufkannn.
4. Giarratano J., Riley G., Expert systems, Principles and Programming, PWS Publising Company.

Embedded Systems

Unit-I

Embedded system:- Definition, components, I/O, Processor, Memory, Characteristics, attributes, design metrics, design challenges, application areas, Issues of designing efficient Embedded system, Difference between ES and PC, Design Technology, Integration and Testing of Embedded Hardware and Firmware, Embedded System Development Environment:-IDE, compiler, assembler, simulator, Emulator, debugging, Target hardware debugging and Boundary Scan, EDLC, Trends in the Embedded Industry: Processor trends, OS trends, Development languages trends, Open Standard and framework. S/W H/W Co-design.

Unit-II

Microcontroller:-Introduction, criteria for choosing a microcontroller, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, Memory Organization of 8051, SFR, Addressing Modes, Instruction set including bit manipulating instruction and programming using it, Subroutine, Stack, Time delay generations and calculations, I/O port programming, Programming of 8051 Timers, Counter Programming. Watch Dog Timer, Real Time clock.

Unit -III

8051 hardware connections, basics of Communication with 8051, Basics of Communication, Overview of RS-232, I2C Bus, UART, USB, 8051 connections to RS-232, 8051 serial communication programming, 8051 interrupts, Programming of timer interrupts, Programming of External hardware interrupts, Programming of the serial communication interrupts, Interrupt priority in the 8051

Unit-IV

Basic Concepts of Interfacing, Introduction 8051 Interfacing to an external memory and Accessing External data Memory and External Code Memory, Interfacing to LCD/Keyboard, DAC/ADC, Sensors, a Stepper Motor, Interfacing with 8255

Unit-V

Real-Time Operating Systems: Review of Concepts, Basic Concepts, Types of RTOS, RTOS Issues, Implementing of RTOS, Distributed Processing Systems-Networking with mCAN: Design Approaches, CAN protocol, RTOS:- introduction, type, overview of commercially available RTOS, Introduction to ES design using RTOS .

References:

1. Introduction to Embedded Systems, Shibu K V, TMH.
2. Embedded System Design, Frank Vahid & Tony Givargis, John Wiley & sons.
3. "The 8051 Microcontroller and Embedded Systems", M.A. Mazidi and J. G. Mazidi, PHI.
4. An Embedded Software Primer, David E. Simon, Pearson Education.
5. "Embedded Systems", Raj Kamal, TMH.

Computer Graphics

Unit I

Overview of Graphics Systems: Video Display Devices , Refresh cathode ray tubes, Refresh scan displays, Random scan displays, color CRT Monitors, DVST, Flat- Panel displays, Three Dimensional viewing devices, Raster scan systems, Input Devices: Keyboards, Mouse, Track ball, Joysticks, Data Glove, Touch Panels, Light pens.

Unit II

Curves and Surfaces: Line Drawing Algorithm, DDA Algorithm, Bresenham's Line Drawing Algorithm, Bresenham's Circle Drawing Algorithm, Ellipse Drawing Algorithm, Pixel Addressing and object geometry: Screen Grid coordinates, Maintaining Geometry properties of Displayed objects.

Unit III

Geometric Transformation: Homogeneous Coordinate System for 2D and 3D, Various 2D, 3D Transformation matrices (Translation, Scaling, Rotation, Shear), Rotation about an arbitrary point (2D), Rotation about an arbitrary axis (3D), Computing location of V.P, Clipping Algorithms, SutherlandCohen Clipping Algorithm.

Unit IV

Curves and Visible Surface Detection Methods: Bezier Curves, 4 point and 5 point Bezier curves using Bernstein Polynomials, B-Spline Curves, Computing control points given end slopes for a specified curve segment. Back Face Detection, Depth Buffer (Z-Buffer, A-Buffer) Method, Scan Line Method, Depth Sorting Method, Area Subdivision Method.

Unit V

Illumination Model and Surface Rendering: Basic Illumination models, shading models for curve surfaces, Half tone Pattern and Dithering Techniques, Rendering, Color Models: XYZ Color Model, RGB, YIQ, CMY, HSV, HLS.

References:

1. Computer Graphics, D. Hearn and P. Baker, Prentice Hall.
2. Computer Graphics, R. Plastock and Z.Xiang, Schaum's Series, McGraw Hill.
3. Computer Graphics Principles & Practice, Foley et. al., Addison Wesley.
4. Procedural Elements for Computer Graphics, David F. Rogers, McGraw Hill.
5. Principles of Interactive Computer Graphics, W. Newman and R. Sproul, McGraw-Hill.

Cloud Computing

Unit I: INTRODUCTION

Cloud Computing – Evolution of Cloud Computing, the role of networks in Cloud computing, essential characteristics of Cloud computing, Cloud deployment model, Cloud service models, Cloud cube model, Advantages and Disadvantages of Cloud Computing.

Unit II: Cloud Services and Data in Cloud

Web-Based Application – Pros and Cons of Cloud Service Development. Types of Cloud Service Development – Software as a Service, Platform as a Service, Infrastructure as a Service. Storage system architecture, Big data, Virtualized Data Centre (VDC) architecture.

Unit III: Virtualization, Server, Storage and Networking

Virtualization concepts, types, Server virtualization, Storage virtualization, Storage services, Network virtualization, Service virtualization, Virtualization technologies and architectures, Hypervisors: KVM, Xen, Different hypervisors and features.

Unit IV: Cloud Security

Cloud Security risks, Security, Privacy, Trust, Operating system security, Security of virtualization, Security risks posed by shared images, Security risk posed by a management OS, Trusted virtual machine monitor.

Unit V: QoS [Quality of Service] of Cloud and Cloud Patterns

Taxonomy and survey of QoS management and service, Selection methodologies for cloud computing, Auto scaling, Load balancing in Cloud. Discovering Cloud Services and tools – Amazon EC2, Google App Engine, IBM Clouds.

References:

1. Dr. Kumar Saurabh, "Cloud Computing", Wiley Publication
2. Borko Furht, "Handbook of Cloud Computing", Springer
3. Venkata Josyula, "Cloud computing – Automated virtualized data center", CISCO Press
4. Greg Schulr, "Cloud and virtual data storage networking", CRC Press
5. Mark Carlson, "Cloud data management and storage", Mc Graw hill
6. Lizhe Wang, "Cloud Computing: Methodology, System and Applications", CRC Press
7. Cloud computing: Data Intensive Computing and Scheduling by Chapman Hall/CRC
8. Christopher M. Moyer, Building Applications in the Cloud: Concepts, Patterns, and Projects