FOR ADMISSION BATCH 2024-25
MASTER IN COMPUTER APPLICATION
SECOND YEAR (FOURTH SEMESTER)

Sl. No.	Category	Course Code	Course	Contact Hrs. L-T-P	Credit	University Marks	Internal Evaluation
Subject (Theory)							
1.	PE	MCPE2013	Deep Learning	3-0-0	3	100	50
		MCPE2014	Distributed Systems				
		MCPE2015	Computer Graphics and Animation				
		MCPE2016	Software Project Management				
		MCPE2017	Network Security				
		-	**Any one Online Course of 25-40 Hours from NPTEL MOOC Pool from the specified List-1.**				
2.	PE	MCPE2018	Image Processing	3-0-0	3	100	50
		MCPE2019	Real-Time Systems				
		MCPE2020	Multimedia Technology				
		MCPE2021	Research Methodology and IPR				
		MCPE2022	Cyber Security and Cyber Laws				
		-	**Any one Online Course of 25-40 Hours from NPTEL MOOC Pool from the specified List-2.**				
Subject (Practical / Sessional)							
3.	PSI	MCPS2202	Comprehensive Viva – Voce		2	-	100
4.	PSI	MCPS2203	Industrial Research Project	0-0-16	8	-	100
Total				**6-0-16**	**16**	**200**	**300**

List-1		**List-2**	
Course Code	**Course**	**Course Code**	**Course**
MCNT2201	Mobile Computing	MCNT2211	Big-Data Analytics
MCNT2202	Introduction to Data Science	MCNT2212	Advanced Computer Networks
MCNT2203	Internet-of-Things	MCNT2213	Cloud Computing
MCNT2204	Wireless Sensor Networks.	MCNT2214	Simulation and Modelling
MCNT2205	Information System Design	MCNT2215	Cloud Computing
MCNT2206	Advanced Database Management Systems	MCNT2216	Distributed Operating System
MCNT2207	E-Commerce and ERP	MCNT2217	Management Information System
-		MCNT2218	Intelligent Data Analysis
-		MCNT2219	Computer Based Optimization Techniques

Note: Click here to view/download the syllabus of the subjects.

MCPE2013 DEEP LEARNING (3-0-0)

Module I

Fundamentals of Deep Networks – Defining Deep Learning, What Is Deep Learning? Common Architectural Principles of Deep Networks: Parameters, Layers, Activation Functions, Loss Functions, Hyper parameters

Module II

Building Blocks of Deep Networks – Restricted Boltzmann Machine, Autoencoders, Variational Autoencoders. Major Architectures of Deep Networks: Unsupervised pretrained networks, Deep Belief Networks, Generative Adversarial Networks.

Module III

Convolutional Neural Networks (CNNs) – The Convolution Operation, Motivation, Pooling, Variants of the Basic Convolution Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Random or Unsupervised Features, The Neuro-scientific Basis for Convolutional Networks, Applications.

Module IV

Sequence Modeling – Recurrent and Recursive Nets – Unfolding Computational Graphs, Recurrent Neural Networks, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks, The Long Short-Term Memory and Other Gated RNNs, Applications

Deep Learning applications – Computer Vision, Speech Recognition, Natural Language Processing, Other Applications.

Course Outcomes:

At the end of the course, the student will be able to:

1. Understand the fundamental concepts of Deep learning.
2. Apply concepts of deep networks to analyze various architectures.
3. Apply deep learning models to build applications in various domains.
4. Analyze the given problem and apply suitable deep learning algorithm.

Text Books

1. Josh Patterson and Adam Gibson, — Deep learning: A practitioner's approachll, O'Reilly Media, First Edition, 2017. 2.
2. Ian Goodfellow, Yoshua Bengio, Aaron Courville, — Deep Learningll, MIT Press, 2016.

Reference Books

1. Deep learning, Amit Kumar Das,Saptarsi Goswami, Pabitra Mitra, Amlan Chakrabarti, First Edition,2021, Pearson
2. Fundamentals of Deep Learning, Designing next-generation machine intelligence algorithms, Nikhil Buduma, O_Reilly, Shroff Publishers, 2019.
3. Deep learning Cook Book, Practical recipes to get started Quickly, Douwe Osinga, O_Reilly, Shroff Publishers, 2019.
4. Deep learning Illustrated A Visual Interactive Guide to Artificial Intelligence,Jon Krohn,Grant Beyleveld,Aglae Bassens,First Edition,2020, Pearson.

MCPE2014 DISTRIBUTED SYSTEMS (3-0-0)

Course Objectives

The objective of the course is to:

- To have a broad and up-to-date coverage of the principles and practice in the area of Distributed Systems.
- To understand the heterogeneous systems such as computers, mobile phones, other devices and Internet) and their functionalities.

Module – I

Definition of a distributed systems, Examples, Resource sharing and the Web, Challenges, System models, Architectural and fundamental models, Networking Interprocess communication, External data representation and marshalling, Client-server and Group communication.

Module – II

Distributed objects and remote invocation, Communication between distributed objects, Remote procedure call, Events and notifications - The operating system layer, Protection, Processes and Threads, Communication and invocation, OS Architecture. Security techniques, Cryptographic algorithms, Access control, Digital signatures, Cryptography pragmatics, Needham-Schroeder, Kerberos, Securing electronics transaction, IEEE 802.11 WiFi.

Module – III

Operating System Issues: Distributed file systems - Name services, Domain name system, Directory and discovery services, Peer to peer systems, Napster file sharing system, Peer to peer middleware routing overlays – Clocks, Events and process states Clock Synchronization - Logical clocks Global states - Distributed debugging - Distributed mutual exclusion - Elections - Multicast communication.

Module – IV

Distributed Transaction Processing: Transactions - Nested transactions - Locks - Optimistic concurrency control - Timestamp ordering - Flat and nested distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery - Overview of replication, Distributed shared memory and Web services. Synchronous network model - Algorithms: leader election, maximal independent set, Asynchronous system model: I/O automata, operations on automata, fairness - Asynchronous shared memory model - Mutual exclusion: model, the problem, stronger conditions, lockout-free mutual exclusion algorithms, lower bound on the number of registers - Asynchronous network model - Asynchronous network algorithms: leader election in a ring and an arbitrary network.

Course Outcomes:

Upon successful completion of the course, the student shall be able to:

- Developing skill set in developing a distributed system.
- Designing and evaluation of algorithms and protocols for various distributed systems.

Textbooks:

George Coulouris, Jean Dollimore, and Tim Kindberg, " Distributed Systems Concepts and Design", 5th ed., Pearson Education, 2011.

Andrew S. Tanenbaum, Maartenvan Steen, "Distributed Systems Principles and Paradigms", 2nd ed., Pearson Education, 2006.

Nancy A. Lynch, "Distributed Algorithms", Hardcourt Asia Pvt. Ltd., Morgan Kaufmann, 2000.

MCPE2015 COMPUTER GRAPHICS AND MULTIMEDIA (3-0-0)

Course Objectives

- This course aims at teaching students about algorithms involved in 2D and 3D computer graphics and animation.
- It gives a clear foundation of the graphic operations performed on 2D objects.
- It enables the students to create 3D realistic objects and generate 2D, 3D animations.

Module 1

An Introduction Graphics System : Computer Graphics and Its Types, Application of computer graphics, Graphics Systems : Video Display Devices, Raster Scan Systems, Random Scan Systems, Graphics Monitors and Work Stations, Input Devices, Hard Copy Devices, Graphics Software.

Module 2

Output Primitives and Attributes of Output Primitives : Output Primitive Points and Lines,Line Drawing Algorithms, Circle Generating Algorithms, Scan-Line Polygon Fill Algorithm, Inside-Outside tests, Boundary-Fill Algorithm, Flood Fill Algorithm, Cell Array, Character Generation, Attributes of Output Primitives : Line Attributes, Color and Grayscale Levels, Area fill Attributes, Character Attributes, Bundled Attributes, Anti-aliasing.

Module 3

Two-dimensional Geometric Transformations : Basic Transformations, Matrix Representation and Homogeneous Coordinates, Composite Transformations,Reflection and Shearing. Two-Dimension Viewing : The viewing Pipeline, Window to view port coordinate transformation, Clipping Operations, Point Clipping, Line Clipping,Polygon Clipping, Text Clipping, Exterior Clipping. Three-Dimensional Concepts : Three Dimensional Display Methods, 3D Transformations, Parallel Projection and Perspective Projection.

Module 4

Multimedia : Introduction to Multimedia : Classification of Multimedia, Multimedia Software, Components of Multimedia – Audio : Analog to Digital conversion, sound card fundamentals, Audio play backing and recording Video, Text : Hypertext, Hyper media and Hyper Graphics, Graphics and Animation :Principle of animation, Types of Animation, deformation,character of animation,Key frame Vs. Procedural Animation, Methods of Controlling Animation, Morphing, Authoring Process and Tools.

Course Outcomes

CO1: Understand the basic shapes, 2D and 3D viewing in computer graphics.
CO2: Perform geometric transformations on objects.
CO3: Apply graphics algorithms for rendering objects and surfaces.
CO4: Create 3D objects in the graphics environment and render the scene using open-source tools.

Text Books:

1. Donald Hearn & M. Pauline Baker, “Computer Graphics with OpenGL”, Third Edition, 2004, Pearson Education, Inc. New Delhi.
2. Ze-NianLi and Mark S. Drew, “Fundamentals of Multimedia”, First Edition, 2004, PHI Learning Pvt. Ltd., New Delhi.

MCPE2016 SOTWARE PROJECT MANAGEMENT (3-0-0)

Course Objectives:

- This course describes the key aspects of a software project.
- It introduces the basic principles of Engineering Software Projects. Most, if not all, student's complete projects as part of assignments in various courses undertaken. These projects range in size, subject and complexity but there are basic project essentials that need to be understood and practiced for successful team project outcomes.
- The course provides an understanding of the purpose, methods and benefits of process management by exposing the student to the concepts, practices, processes, tools and techniques used in process management for software development.

Module 1 (8 Hour)

PROJECT CONCEPTS AND ITS MANAGEMENT: Project life cycle models, ISO 9001 model, Capability Maturity Model, Project Planning, Project tracking, Project closure. Software Management Process Framework: Phases, Artifacts, Workflows, Checkpoints, Project Organization and Responsibilities.

Module 2 (6 Hour)

COST ESTIMATION: Problems in Software Estimation, Algorithmic Cost Estimation Process, Function Points, SLIM (Software Life cycle Management), COCOMO II (Constructive Cost Model), Estimating Web Application Development.

Module 3 (6 Hour)

SOFTWARE QUALITY MANAGEMENT: Software Quality Factors, Software Quality Components, Software Quality Plan, Software Quality Metrics, Software Quality Costs, Software Quality Assurance Standard, Certification and Assessment.
SOFTWARE MANAGEMENT AND METRICS: Software Configuration Management

Module 4 (10 Hour)

Risk Management: Risk Assessment: Identification / Analysis / Prioritization – Risk Control: Planning / Resolution / Monitoring, Failure Mode and Effects Analysis (FMEA), Defect Management, Cost Management. PROJECT EVALUATION AND EMERGING TRENDS: Strategic Assessment, Technical Assessment, Cost Benefit Analysis, Cash Flow Forecasting, Cost Benefit Evaluation Technique, Software Effort Estimation.

Course Outcome:

1. To understand Software Project Models and Software Management Concepts.
2. To understand the various methods of Cost Estimation.
3. To Study about Software Quality Management.
4. To understand Software Risk management and Project Evaluation.

BOOKS

1. Roger S.Pressman, "Software Engineering- A Practitioner's Approach", 7th Edition ,McGraw Hill, 2010.
2. Daniel Galin, "Software Quality Assurance: from Theory to Implementation", AddisonWesley, 2003.
3. Pankaj Jalote, "Software Project Management in Practice", Pearson, 2002.

MCPE2017 NETWORK SECURITY (3-0-0)

Course Objective:
This course provides an essential study of network security issues and methods in networking systems.

Module 1: Introduction to Network security, Model for Network security, Model for Network access security, Real-time Communication Security: Introduction to TCP/IP protocol stack, Implementation layers for security protocols and implications, IPsec: AH and ESP, IPsec: IKE.

Module 2: Media- Based-Vulnerabilities, Network Device Vulnerabilities, Back Doors, Denial of Service (DoS), Spoofing, Man-in-the-Middle, and replay, Protocol -Based Attacks, DNS Attack, DNS Spoofing, DNS Poisoning, ARP Poisoning, TCP/IP Hijacking, Virtual LAN (VLAN), Demilitarization Zone (DMZ) , Network Access Control (NAC), Proxy Server, Honey Pot, Network Intrusion Detection Systems (NIDS) and Host Network Intrusion Prevention Systems Protocol Analyzers, Internet Content Filters, Integrated Network Security Hardware.

Module 3: Authentication: Kerberos, X.509 Authentication Service, Scanning: Port Scanning, Port Knocking- Advantages, Disadvantages. Peer-to-peer security. Electronic Mail Security: Distribution lists, Establishing keys, Privacy, source authentication, message integrity, non-repudiation, proof of submission, proof of delivery, message flow confidentiality, anonymity, Pretty Good Privacy (PGP)

Module 4: Firewalls and Web Security: Packet filters, Application-level gateways, Encrypted tunnels, Cookies. Assignments on the latest network security techniques, Security applications in wireless sensor networks and wireless Communication networks.

Course Outcome:
Students can get knowledge about the network security, implementation and requirements after the successful completion of the course

Text Book:
William Stallings, “Cryptography and Network Security – Principles and Practices”, Prentice Hall of India, Third Edition, 2003.

References:

1. Saadat Malik, Saadat Malik. “Network Security Principles and Practices (CCIE Professional Development)”. Pearson Education. 2002. (ISBN: 1587050250).
2. Cisco: Fundamentals of Network Security Companion Guide (Cisco Networking Academy Program).
3. Mark Ciampa “Security + Guide to Network Security Fundamentals/Edition 3” Cengage Learning publisher, ISBN-10: 1428340661, ISBN-13: 978-1428340664.

MCPE2018 IMAGE PROCESSING (3-0-0)

Course Objectives

- To learn the fundamentals of image processing and various transformations applied in an image.
- To learn image enhancement techniques.
- To understand image restoration.
- To impart knowledge on different compression techniques.

Module I

Introduction: Introduction to Digital Image Processing, Characteristics of Digital Image, Basic relationship between pixels, Image sampling and quantization, Color models, Basic Geometric Transformations.

Module II

Filtering in the Frequency Domain: preliminary concepts,2D DFT and its properties, basic Filtering in the Frequency Domain, image smoothing and sharpening.

Image Restoration and Reconstruction: Image restoration/degradation model, noise models, restoration in the presence of noise only, estimating the degradation function.

Module III

Color Image Processing: Color Models, Color Transformation, Wavelets and Multi-resolution processing: multiresolution expansions, wavelet transforms in one and two dimension.

Module IV

Image Compression: Fundamentals, Error-free compression: variable length coding, LZW coding. Lossy compression: lossy predictive coding

Morphological Image Processing: Erosion and Dilation, opening and closing.

Course Outcomes: Upon completion of this course, the students will be able to:

CO1 Compare various image enhancement techniques
CO2 Construct the image from the degraded image
CO3 Analyze and use appropriate image compression techniques
CO4 Suggest proper image feature for classification problems
CO5 Apply the theory and algorithms that are widely used in digital image processing

Textbooks:

1. Rafael C. Gonzalez, Richard E Woods, “Digital Image Processing”, Fourth Edition, Pearson Education, 2018.

Reference Books:

1. A.K. Jain, “Fundamentals of Digital Image Processing”, PHI, New Delhi, 1995.
2. S E Umbaugh, “Digital Image Processing and Analysis: Application with MATLAB and CVIP Tools”,Third Edition, Taylor & Francis, CRC Press, 2018.
3. Frank Y. Shih, “Image Processing and Pattern Recognition”, Wiley – IEEE Press, 2010.

MCPE2019 REAL-TIME SYSTEMS (3-0-0)

Module I: Fundamentals of Real-Time Systems
Definition and characteristics of Real-Time Systems, Hard vs Soft Real-Time Systems, Real-Time workloads and task types, Task parameters: WCET, deadlines, release time, period, jitter, Real-Time system design issues, Performance metrics, Modeling Real-Time systems, Real-Time taxonomy

Module II
Preemptive and Non-Preemptive scheduling, Clock-driven scheduling,Table-driven scheduling, Priority-driven scheduling: Rate Monotonic Scheduling (RMS), Deadline Monotonic Scheduling, EDF Scheduling, Schedulability analysis, Multiprocessor scheduling basics, Priority inversion & priority inheritance protocol.

Module III
Inter-task communication models: Message-based communication, Shared memory communication, Mutual exclusion in real-time systems, Priority ceiling protocol (PCP), Deadlock, starvation, and bounded blocking, Clock synchronization — physical and logical clocks, Communication delays and timing constraints

Module IV
Real-Time Memory, OS Support & Case Studies: Real-Time Operating Systems basics, Real-Time Kernel requirements, Task control blocks, Interrupt handling, Timing services, Real-Time I/O handling, DMA control, Real-Time Memory Management: Contiguous allocation, Paging issues, Fragmentation, Real-Time OS case study examples: VxWorks, POSIX real-time extensions

Course Outcomes:
At the end of the course, the student will be able to:
1. Understand the characteristics, constraints, and modeling of real-time systems.
2. Ability to analyze and determine schedulability using classical algorithms.
3. Understand real-time resource sharing, synchronization, and communication models.
4. Learn OS-level support, memory issues, interrupt management, and system-level integration.

Text Books
1. Real-Time Systems: Theory and Practice, *Rajib Mall, Pearson Education*.

Reference Books
1. Real-Time Systems, Jane W. Liu, Pearson
2. Real-Time Systems, Krishna & Shin, McGraw-Hill
3. Real-Time Concepts for Embedded Systems, Qing Li & Caroline Yao, Elsevier/Morgan Kaufmann

MCPE2020 MULTIMEDIA TECHNOLOGY (3-0-0)

Course Objectives:

The objective of the course is to:

- Introduce various aspects of multimedia components like Images, audio, sound and computer graphics.
- Provide hands-on training in the use of Image Editing tools with software.
- Gain hands-on experience through a series of practical skill building tasks and exercises.

Module I:

Multimedia- Definitions, Use of Multimedia, Introduction To Making Multimedia: The Stages of a Multimedia Project, Need, Creativity, Organization, Communication. Text-About Fonts and Faces, Cases, Serif Versus Sans Serif, Using Text in Multimedia, Computers and Text, Font editing and design tools, Hypermedia and Hypertext. Designing for the World Wide Web-Developing for the Web, Text for the Web, Images for the Web, Sound for the Web, Animation for the Web.

Module II:

Images: Making Still Images, Bitmaps, Vector Drawing, 3-D Drawing and Rendering, Color, Understanding Natural Light and Color, Computerized Color, Color Palettes, Image File Formats.

Module III:

Image Editing software: selection tools, working with layers, masks and channels, correcting and enhancing photographs, typographic design and vector drawing, working with 3D images, producing files for the web.

Module IV:

Animation-Principles of Animation, Animation by Computer, Animation Techniques, Animation File Formats, Making Animations that Work, a Rolling Ball, a Bouncing Ball, Creating an Animated Scene; Installing and using animation software (Flash or Blender), adding animation, tweening, morphing; Interactive navigation-working with sound and video.

Course Outcomes:

Upon successful completion of the course, the student shall be able to:

CO1 Critically analyze the key components of multimedia technologies including text, graphics, voice, video and animation and the broad principles associated with multimedia concepts used in computer graphics.

CO2 Create vector and typographic designs and apply masking effect to images and create an animation using the tools panel.

CO3 Design an image using image editing tools and apply effectively.

CO4 Create animated sequence with titles applying the principles of animation.

CO5 Apply acquired knowledge in the field of multimedia for the good cause like advertisement in practice and independently continue to expand knowledge in this field.

Textbook:

Tay Vaughan,Multimedia: Making it Work (Seventh Edition) (2010). McGraw Hill.

MCPE2021 RESEARCH METHODOLOGY AND IPR (3-0-0)

Course Overview
This course provides foundational and advanced knowledge on research methodology and intellectual property rights. It trains students in scientific research processes, data analysis, research ethics, and protection of intellectual assets.

Course Objectives
- Understand the fundamentals and process of scientific research.
- Develop skills in research design, data collection, and analysis.
- Gain exposure to various statistical tools used in hypothesis testing.
- Understand the concepts of IPR including patents, trademarks, copyrights, and designs.

Module 1: Introduction to Research Methodology
Definition, objectives, and significance of research.
Types of research: Qualitative, Quantitative, Fundamental, Applied.
Research ethics and plagiarism.
Literature review, identification of research gaps, and citation styles.

Module 2: Research Design and Hypothesis Formulation
Research design: need, features, and components.
Variables: dependent, independent, control variables.
Experimental designs: CRD, RBD, Latin Square, Factorial Design.
Hypothesis: formulation, types, and characteristics.

Module 3: Data Collection and Statistical Analysis
Primary and secondary data collection methods.
Sampling: need, principles, and sampling techniques.
Statistical analysis: measures, tests (mean, variance, chi-square testing).
Hypothesis testing: Type I & II errors, level of significance.

Module 4: Intellectual Property Rights
Introduction to IPR and its need in academia and industry.
Patents: types, criteria, filing procedures, rights and limitations.
Trademarks and industrial designs: registration, protection, infringement.
Copyright: scope, rights, limitations, infringement and remedies.

Suggested Activities
Writing a research proposal.
Literature survey and analysis of research papers.
Sampling and hypothesis testing exercises.
Case studies on IPR violations.

Textbook
1. C. R. Kothari, “Research Methodology: Methods and Techniques”, New Age International Publishers.

Reference Books
1. N. Pandey & K. Dharni, “Intellectual Property Rights”, PHI Learning.
2. Ranjit Kumar, “Research Methodology: A Step-by-Step Guide”, SAGE Publications.

3. Neeraj Pandey, “Basics of Intellectual Property Rights”, PHI Learning.

MPE2022 CYBER SECURITY & CYBER LAWS (3-0-0)

Course Objectives:

The objectives of the course are to:

- To understand basic cyber security concepts, network fundamentals, and cryptographic techniques.
- To identify common cyber threats, attacks, and system vulnerabilities.
- To learn essential defense and mitigation methods used to protect systems.
- To gain foundational skills in cyber forensics, including data acquisition and analysis.
- To understand cyber laws, the IT Act 2000, and legal and ethical issues related to emerging technologies.

Module I

Cyber Security Fundamentals: Network and security concepts, Information Assurance fundamentals, Basic cryptography, Symmetric and Asymmetric encryption, Public key encryption, Domain Name System (DNS), Firewalls, Virtualization, and Radio-Frequency Identification (RFID).

Module II

Threats and Vulnerabilities: Types of threats: Malware, Phishing, Ransomware, Adware, Spyware, Trojans, Viruses, Worms, Man-in-the-Middle attacks, Scareware, Distributed Denial-of-Service (DDoS) attacks, Rootkits, and Click-fraud. Vulnerabilities-Shellcode, Integer overflow vulnerabilities, Buffer overflows, and SQL injection.

Defense and Mitigation Measures: Anti-virus scanners, static and dynamic analysis methods, anti-analysis techniques, detecting and preventing obfuscation, and identifying run-time attacks.

Module III

Cyber Forensics: Memory and network forensics for Windows and Linux internals, forensic tools, OS hardening, RAM dump analysis, data acquisition and extraction, volatility analysis for OS artifacts and related information, Automated malicious code analysis.

Module IV

Cyber Laws and Legal Framework: Cybercrime and the global legal landscape, IT Act 2000 and its amendments, limitations of the IT Act 2000, cybercrimes and punishments, legal and ethical aspects related to new technologies: AI/ML, IoT, Blockchain, Darknet, and Social Media, cyber laws of other countries, and relevant case studies.

Course Outcomes:

At the end of the course, the student will be able to:

1. Understand the fundamentals of cyber security.
2. Identify and evaluate cyber security threats and vulnerabilities.
3. Apply suitable security techniques and policies to protect systems and information.
4. Recognize common design trade-offs in developing secure information systems.
5. Use cyber laws and standards to improve information security and system protection.

Books:

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives - N. K. Ghosh, McGraw-Hill.
2. Cryptography and Network Security: Principles and Practice - William Stallings, Pearson.
3. Computer Security: Principles and Practice - William Stallings & Lawrie Brown, Pearson.

Reference Books:

1. Practical Malware Analysis - Michael Sikorski & Andrew Honig, No Starch Press.
2. Incident Response & Computer Forensics - Jason Luttgens, Matthew Pepe & Kevin Mandia, McGraw-Hill.
3. The Art of Memory Forensics - Michael Hale Ligh, Andrew Case, Jamie Levy & AAron Walters, Wiley.
4. Cyber Law in India - Farooq Ahmad.
5. Network Security Essentials - William Stallings, Pearson.