

# **SEMESTER VI**

<b>Branch: B.Sc.(IT)</b>	<b>Semester-VI</b>
<b>Subject Code: 6101</b>	<b>Lecture: 04</b> <b>Credit: 04</b>
<b>Course Opted</b>	<b>Core Course -18</b>
<b>Subject Title</b>	<b>INTELLIGENT PROPERTY RIGHTS AND CYBER LAWS</b>

**Course Objectives:**

- To make students aware of Intellectual Properties & its various components.
- To make students understand the basic exclusive rights granted by IPR and their legal acquisition.
- To elaborate the concept of Infringement & remedies against IPR infringement.
- To clear the concepts of Licensing & Assignment of IPR.
- Informing students about various International Treaties & obligations.
- Clearing the concepts about law, cyber law & cyber jurisprudence.
- To make students aware of E-commerce, digital contracts & digital signature.
- To make student aware about use of ICT in governance i.e. E-governance.
- To teach IT act 2000 & relevant laws.

**Course Outcomes:**

- Complete knowledge about different IPs & exclusive rights granted by them.
- Legal remedies in case of IPR infringement.
- Introducing Cyber Jurisprudence.
- Knowledge about Implementation of E-Commerce & E-Governance & relevant laws in India.
- Understanding the menace of cybercrimes & its legal remedies.
- Complete knowledge of IT Act 2000.

<b>Modules</b>	<b>Sr. No.</b>	<b>Topic and Details</b>	<b>No. of Lectures Assigned</b>	<b>Marks Weightage %</b>
UNIT - I	1	<b>Intelligent Property Rights:</b> Basic Principles and Acquisition of Intellectual Property Rights: Philosophical Aspects of Intellectual Property Laws, Basic Principles of Patent Law, Patent Application Procedure, Drafting of a Patent Specification, Understanding Copyright Law, Basic Principles of Trademark, Basic principles of Design Rights, International Background of Intellectual Property	5	10
	2	<b>Information Technology Related Intellectual Property Rights:</b> <b>Computer Software and Intellectual Property:</b> Objective, Copyright Protection, Reproducing Defences, Patent Protection. <b>Database and Data Protection:</b> Objective, Need for Protection, UK Data Protection Act, 1998 US Safe Harbour Principle Enforcement. <b>Protection of Semi- Conductor Chips:</b> Objectives, Justification of Protection, Criteria, Subject matter of Protection, WIPO Treatment, TRIPs, SCPA. <b>Domain Name Protection:</b> Objectives, Domain Name and	5	10

		Intellectual Property, Registration of domain names, disputes under Intellectual Property Rights, Jurisdictional Issues, and International Perspectives.		
UNIT – II	3	<b>Patents (Ownership and Enforcement)</b> Patents: Objectives, Rights, Assignments, Defences in case of Infringement.	5	10
	4	<b>Copyright (Ownership and Enforcement)</b> <b>Copyright:</b> Objectives, Rights, Transfer of Copyright, Work of Employment Infringement, Defences for infringement.	5	10
	5	<b>Trademark (Ownership and Enforcement)</b> <b>Trademarks:</b> Objectives, Rights, Protection of good will, Infringement, Passing off, Defences. <b>Designs:</b> Objectives, Rights, Assignments, Infringements, Defences of Design Infringement.	5	10
UNIT - III	6	<b>Enforcement of Intellectual Property Rights</b> Civil Remedies, Criminal Remedies, Border security measures. <b>Practical Aspects of Licensing:</b> Benefits, Determinative factors, important clauses, licensing clauses.	5	10
	7	<b>Cyber Law</b> <b>Basic Concepts of Technology and Law:</b> Understanding the Technology of Internet, Scope of Cyber Laws, Cyber Jurisprudence <b>Law of Digital Contracts:</b> The Essence of Digital Contracts, The System of Digital Signatures, The role and function of Certifying Authorities, The Science of Cryptography.	5	10
UNIT - IV	8	<b>Cyber Law: Information Technology Act 2000:</b> Information Technology Act – 2000 (Sec 1 to 94), with special emphasis on sections pertaining to cyber offences – Civil Offences: Section 43, Criminal Offences: Section 65 to Section 74 <b>IT Act 2000 and Amendment IT Act 2000</b>	5	10
	9	<b>Cyber Law: Intellectual Property Issues in Cyber Space:</b> Copyright in Digital Media, Patents in the Cyber World. <b>Rights of Netizens and E-Governance:</b> Privacy and freedom issues in the Cyber World, E-Governance, Cyber Crimes and Cyber Laws, Ethical Hacking	5	10
	10	<b>Case Studies:</b> Cases related to different cyber-crimes and punishment given	5	10
<b>TOTAL</b>			<b>50</b>	<b>100</b>

**Text Books:**

1. Cyber law by Vivek Sood, Tata McGraw-Hill Education, 2001

**Reference Books:**

1. Licensing Art & Design by Caryn R. Leland, Allworth Press, 1995
2. A Professional's Guide to Licensing and Royalty Agreements by Caryn R. Leland Allworth Press 1995
3. IT 2000 Bill, (GOI)
4. How To Register Your Own Copyright by Marx Warda, Sphinx Publishing

<b>Branch: B.Sc.(IT)</b>	<b>Semester-VI</b>
<b>Subject Code: 6102</b>	<b>Lecture: 04</b> <b>Credit: 04</b>
<b>Course Opted</b>	<b>Core Course -19</b>
<b>Subject Title</b>	<b>ENTERPRISE RESOURCE PLANNING</b>

**Course Objectives:**

- To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning Technology.
- To focus on a strong emphasis upon practice of theory in Applications and Practical oriented approach.
- To develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.

**Course Outcomes**

- Make basic use of Enterprise software, and its role in integrating business functions
- Analyze the strategic options for ERP identification and adoption.
- Design the ERP implementation strategies.
- Create reengineered business processes for successful ERP implementation.

<b>Module</b>	<b>Sr. No.</b>	<b>Topic and Details</b>	<b>No. of Lectures Assigned</b>	<b>Marks Weightage %</b>
UNIT- I	1	<b>Enterprise: An Overview:</b> Business Functions and Business Processes, importance of Information: Characteristics of information; Types of information, Information System: Components of an information system; Different types of information systems; Management information system, Enterprise Resource Planning: Business modelling; Integrated data model	4	10
	2	<b>Introduction to ERP:</b> Defining ERP, Origin and Need for an ERP System, Benefits of an ERP System, Reasons for the Growth of ERP Market, Reasons for the Failure of ERP Implementation: Roadmap for successful ERP implementation, ERP Architecture, Types of ERP Architecture	4	10
	3	<b>ERP and Related Technologies:</b> Business Process Re-engineering, Management Information systems, Decision Support Systems, Executive Information Systems- Advantages of EIS; Disadvantages of EIS, Data Warehousing, Data Mining, On-Line Analytical Processing, Product Life Cycle Management, Supply Chain Management, ERP Security	4	10
	4	<b>ERP Implementation Life Cycle:</b> ERP Tools and Software, ERP Selection Methods and Criteria, ERP Selection Process, ERP Vendor Selection, ERP Implementation Lifecycle, Pros and cons of ERP implementation, Factors for the Success of an ERP Implementation	4	15

UNIT- II	5	<b>ERP Modules Structure:</b> Finance, Sales and Distribution, Manufacturing and Production Planning- Material and Capacity Planning; Shop Floor Control; Quality Management; JIT/Repetitive Manufacturing; Cost Management ; Engineering Data Management; Engineering Change Control ; Configuration Management ;Serialization / Lot Control ;Tooling, Human Resource, Plant Maintenance- Preventive Maintenance Control; Equipment Tracking; Component Tracking; Plant Maintenance Calibration Tracking; Plant Maintenance Warranty Claims Tracking.	8	10
UNIT - III	6	<b>ERP – A Manufacturing Perspective:</b> Role of Enterprise Resource Planning (ERP) in manufacturing, Computer Aided Design/Computer Aided Manufacturing (CAD/CAM), Materials Requirement Planning (MRP)-Master Production Schedule (MPS);Bill of Material (BOM);Inventory Records; Closed Loop MRP; Manufacturing Resource Planning (MRP-II), Manufacturing and Production Planning Module of an ERP System , Distribution Requirements Planning (DRP), Just-in-Time(JIT) & KANBAN - Kanban; Benefits and pitfalls of JIT; Potential; Kanban, Product Data Management (PDM)- Data Management, Process Management; functions of PDM; Benefits of PDM, Manufacturing Operations- Make-to-Order (MTO) and Make-to-Stock (MTS); Assemble-to-Order (ATO); Engineer-to-Order (ETO); Configure-to-Order (CTO)	8	15
	7	<b>ERP: A Purchasing Perspective:</b> Role of ERP in Purchasing, Purchase Module: Features of purchase module; Benefits of purchase module, ERP Purchase System	4	10
	8	<b>ERP: Sales and Distribution Perspective:</b> Role of ERP in Sales and Distribution, Sub-Modules of the Sales and Distribution Module: Master data management, Order management, Warehouse management, Shipping and transportation, Billing and sales support, Foreign trade, Integration of Sales and Distribution Module with Other Modules	6	10
UNIT-IV	9	<b>ERP Vendors, Consultants, and Employees:</b> Vendors- Role of the Vendor; Consultants: Types of consultants; Role of a Consultant, Employees; Role of employees; Resistance by employees; Dealing with employee resistance, Role of Top Management, Role of Implementation Partner.	4	05
	10	<b>ERP: A HR Perspective:</b> Role of ERP in Human Resource Management: Workflow of ERP human resource management system; Advantages of ERP human resource management system, Human Resource Management Module: Functions of human resource management module; Features of human resource management module; Benefits of human resource management module, Common Sub-Modules of Human Resource Management Module: Personnel management; Organisational management; Payroll management; Time management; Personnel development	4	05
<b>TOTAL</b>			<b>50</b>	<b>100</b>

**Text Book:**

1. ERP in practice – Vaman - TMH

**Reference Books:**

1. Daniel E.O'Leary, Enterprise Resource Planning Systems, Cambridge University Press, 2002.
2. Ellen Monk, Bret Wagner, Concepts in Enterprise resource planning, Cengage learning, Third edition, 2009.

<b>Branch: B.Sc.(IT)</b>	<b>Semester-VI</b>
<b>Subject Code: 6103</b>	<b>Lecture: 04</b> <b>Credit: 04</b>
<b>Course Opted</b>	<b>Core Course -20</b>
<b>Subject Title</b>	<b>ETHICAL HACKING</b>

**Course Objectives:**

- To learn system hacking methodology, steganography, steganalysis attacks, and covering tracks to discover system and network vulnerabilities.
- To learn about different types of malwares (Trojan, Virus, worms, etc.), system auditing for malware attacks, malware analysis, and countermeasures.
- Learning Packet sniffing techniques to discover network vulnerabilities and countermeasures to defend sniffing. Social engineering techniques and how to identify theft attacks to audit human level vulnerabilities and suggest social engineering countermeasures.
- To learn DoS/DDoS attack techniques and tools to audit a target and DoS/DdoS countermeasures.
- To learn Session hijacking techniques to discover network-level session management, authentication/authorization, cryptographic weaknesses, and countermeasures.
- To learn about Web server attacks and a comprehensive attack methodology to audit vulnerabilities in web server infrastructure, and countermeasures.

**Course Outcomes:**

- Better understanding of pitfalls in network & system security.
- Testing network security and its various entities by attacking the target network.
- Network security engineers capable of dealing with real world security threats.

<b>Modules</b>	<b>Sr. No.</b>	<b>Topic and Details</b>	<b>No of Lectures Assigned</b>	<b>Marks Weightage %</b>
UNIT - I	1	<b>Introduction to Ethical Hacking, Ethics, and Legality:</b> Defining Ethical Hacking, Understanding the Purpose of Ethical Hacking, An Ethical Hacker's Skill Set Ethical Hacking Terminology, The Phases of Ethical Hacking, Identifying Types of Hacking Technologies Identifying Types of Ethical Hacks, Understanding Testing Types, How to Be Ethical, Performing a Penetration Test	2	5
	2	<b>Gathering Target Information: Reconnaissance, Footprinting, and Social Engineering:</b> Reconnaissance, Understanding Competitive Intelligence, Information-Gathering Methodology, Footprinting Using Google to Gather Information, Understanding DNS Enumeration, Understanding Whois and ARIN Lookups, Identifying Types of DNS Records, Using Traceroute in Footprinting, Understanding Email Tracking, Understanding Web	3	5

		Spiders, Social Engineering, The Art of Manipulation, Types of Social Engineering-Attacks, Social-Engineering Countermeasures		
	3	<b>Gathering Network and Host Information: Scanning and Enumeration:</b> Scanning, Scanning Methodology, Ping Sweep Techniques, nmap Command Switches, Scan Types, TCP Communication Flag Types, War-Dialing Techniques, Banner Grabbing and OS Fingerprinting Techniques, Scanning Anonymously, Enumeration, Null Sessions, SNMP Enumeration, Windows 2000 DNS Zone Transfer	3	5
	4	<b>System Hacking: Password Cracking, Escalating Privileges, and Hiding Files:</b> The Simplest Way to Get a Password, Types of Passwords, Passive Online Attacks, Active Online Attacks, Offline Attacks, Nonelectronic Attacks, Cracking a Password, Understanding the LAN Manager Hash Cracking Windows 2000 Passwords, Redirecting the SMB Logon to the Attacker, SMB Relay MITM Attacks and Countermeasures, NetBIOS DoS Attacks, Password-Cracking Countermeasures Understanding Keyloggers and Other Spyware Technologies, Escalating Privileges, Executing Applications. Buffer Overflows, Understanding Rootkits, Planting Rootkits on Windows 2000 and XP Machines, Rootkit Embedded TCP/IP Stack, Rootkit Countermeasures, Hiding Files, NTFS File Streaming, NTFS Stream Countermeasures, Understanding Steganography Technologies, Covering Your Tracks and Erasing Evidence	5	10
UNIT - II	5	<b>Trojans, Backdoors, Viruses, and Worms:</b> Trojans, Backdoors, Viruses, and Worms, Trojans and Backdoors, Overt and Covert Channels, Types of Trojans, How Reverse-Connecting Trojans Work, How the Netcat Trojan Works, Trojan Construction Kit and Trojan Makers, Trojan Countermeasures, Checking a System with System File Verification, Viruses and Worms, Types of Viruses, Virus Detection Methods	3	6
	6	<b>Gathering Data from Networks: Sniffers:</b> Understanding Host-to-Host Communication, How a Sniffer Works, Sniffing Countermeasures, Bypassing the Limitations of Switches, How ARP Works, ARP Spoofing and Poisoning Countermeasures, Wireshark Filters, Understanding MAC Flooding and DNS Spoofing	2	4
	7	<b>Denial of Service and Session Hijacking:</b> Denial of Service and Session Hijacking, Denial of Service, How DDoS Attacks Work, How BOTs/BOTNETs Work, Smurf and SYN Flood Attacks, DoS/DDoS Countermeasures, Session Hijacking, Sequence prediction, Dangers Posed by Session Hijacking, Preventing Session Hijacking	2	5



	8	<b>Web Hacking: Google, Web Servers, Web Application Vulnerabilities, and Web-Based Password Cracking Techniques:</b> How Web Servers Work, Types of Web Server Vulnerabilities, Attacking a Web Server, Patch-Management Techniques, Web Server Hardening Methods, Web Application Vulnerabilities, Web Application Threats and Countermeasures, Google Hacking, Web-Based Password-Cracking Techniques, Authentication Types, Password Attacks and Password Cracking	5	10
UNIT - III	9	<b>Attacking Applications: SQL Injection and Buffer Overflows:</b> SQL Injection, Finding a SQL Injection Vulnerability, The Purpose of SQL Injection, SQL Injection Using Dynamic Strings, SQL Injection Countermeasures, Buffer Overflows, Types of Buffer Overflows and Methods of Detection, Buffer Overflow Countermeasures	5	10
	10	<b>Wireless Network Hacking:</b> Wi-Fi and Ethernet, Authentication and Cracking Techniques, Using Wireless Sniffers to Locate SSIDs, MAC Filters and MAC Spoofing, Rogue Access Points, Evil Twin or AP Masquerading, Wireless Hacking Techniques, Securing Wireless Networks	5	10
	11	<b>Physical Site Security:</b> Components of Physical Security, Understanding Physical Security, Physical Site Security Countermeasures, What to Do After a Security Breach Occurs	2	5
	12	<b>Hacking Linux Systems:</b> Compiling a Linux Kernel, GCC Compilation Commands, Installing Linux Kernel Modules Linux Hardening Methods	3	5
UNIT - IV	13	<b>Bypassing Network Security: Evading IDSs, Honeypots, and Firewalls:</b> Types of IDSs and Evasion Techniques, Firewall Types and Honeypot Evasion Techniques	2	5
	14	<b>Cryptography:</b> Cryptography and Encryption Techniques, Types of Encryption, Stream Ciphers vs. Block Ciphers, Generating Public and Private Keys, Other Uses for Encryption, Cryptography Algorithms, Cryptography Attacks.	3	5
	15	<b>Performing a Penetration Test:</b> Defining Security Assessments, Penetration Testing, Penetration Testing Steps, The Pen Test Legal Framework, Automated Penetration Testing Tools, Pen Test Deliverables	5	10
<b>TOTAL</b>			<b>50</b>	<b>100</b>

**Text Book:**

1. CEH Certified Ethical Hacker Study Guide by Kimberly Graves (Wiley)2010.

**Reference Books:**

1. Hacking: The Art of Exploitation, 2nd Edition, by Jon Erickson

2. Penetration Testing: A Hands-On Introduction to Hacking by Georgia Weidman
3. Hacking: 4 Books in 1- Hacking for Beginners, Hacker Basic Security, Networking Hacking, Kali Linux for Hackers by Erickson Karna and CODING HOOD,2019
4. Learn Ethical Hacking from Scratch: Your stepping stone to penetration testing by Zaid Sabih,2018 Packt Publishing Limited
5. Atul Kahate, Cryptography and Network Security, McGraw Hill
6. Kaufman, C., Perlman, R.,& Speciner, M., .Network Security, Private Communication in a Public world, 2nd ed., Prentice Hall PTR, 2002
7. Stallings, W., .Cryptography and Network Security: Principles and Practice, 3rd ed., Prentice Hall PTR., 2003
8. Stallings, W., .Network Security Essentials: Applications and Standards, Prentice Hall, 2000

<b>Branch: B.Sc.(IT)</b>	<b>Semester-VI</b>
<b>Subject Code: 6104</b>	<b>Lecture: 04</b> <b>Credit: 04</b>
<b>Course Opted</b>	<b>Discipline Specific Elective -4</b>
<b>Subject Title</b>	<b>MACHINE LEARNING</b>

**Course Objectives**

- To introduce various statistical and machine learning concepts and methods.
- To introduce machine learning solutions to regression, classification and clustering problems.
- To evaluate and interpret the results of algorithm.

**Learning Outcomes**

- Perform end-to-end process of investigating data through a machine learning lens.
- Extract and identify best features of data.
- Evaluate the performance of machine learning algorithms.

Modules	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage %
UNIT - I	1	<b>Introduction:</b> Introduction to Machine Learning, Types of Machine Learning, Application of Machine Learning, Steps in developing a Machine Learning Application.	5	10
	2	<b>Introduction to Neural Network</b> – Fundamental concept, Evolution of Neural Networks, Biological Neuron, Artificial Neural Networks, NN architecture	5	10
UNIT - II	3	<b>Statistical Concepts:</b> Formation of Mean, Median, Mode, Confusion Matrix, Bias and Variance Analytics Problem Solving, Inferential Statistics, Exploratory Data Analysis	5	10
	4	<b>Regression basics:</b> Relationship between attributes using Covariance and Correlation, Relationship between multiple variables: Regression (Linear, Multivariate) in prediction. Logistic Regression, Regularization, Regularized Linear Regression, Regularized Logistic Regression	5	10
UNIT -III	6	<b>Types of Classification:</b> Classification Predictive Modeling Binary Classification, Multi-Class Classification, Multi-Label Classification, Imbalanced Classification	5	10
	7	<b>Types of Classification Algorithms:</b> -Naïve Bayes, Support Vector Machine and k-nearest neighbor, Stochastic Gradient Descent Decision Tree, Random Forest, Support Vector Machine.	5	10
UNIT -IV	8	<b>Unsupervised Learning:</b> k-means Clustering, Hidden Markov Model, DBSCAN Clustering, Unsupervised Learning-Principal Component Analysis.	5	10
	9	<b>Introduction to Deep learning,</b> Architectures: Deep Neural Network, Deep Belief Network(DBN), Markov model,	5	10
	10	Applications of Machine Learning Algorithms. Deep Learning applications: Image Processing, Natural Language Processing, Speech Recognition, Video Analytics	5	10

		<b>TOTAL</b>	<b>50</b>	<b>100</b>
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**Text Book:**

1. Dr. A Krishna Mohan, Dr. T Murali Mohan, Karunakar, "Python with Machine Learning", S. Chand Prakashan, 2020, 1<sup>st</sup> Edition

**Reference Books:**

1. Introduction to Machine Learning, Ethem Alpaydin. —2<sup>nd</sup> Edition, The MIT Press, Cambridge, Massachusetts, London, England.
2. Introduction to Artificial Neural Systems, J. Zurada, St. Paul: West.
3. Machine Learning, Tom M Mitchell, McGraw Hill, 1<sup>st</sup> Edition, 2017
4. Dr. Nilesh Shelke, Dr. Narendra Chaudhari, Dr. Gopal Sakarkar "Introduction to Machine Learning", DAS GANU PRAKASHAN, 1<sup>st</sup> Edition.

<b>Branch: B.Sc.(IT)</b>	<b>Semester-VI</b>
<b>Subject Code: 6105</b>	<b>Lecture: 04 Credit: 04</b>
<b>Course Opted</b>	<b>Discipline Specific Elective -5</b>
<b>Subject Title</b>	<b>BLOCK CHAIN TECHNOLOGY</b>

**Course Objectives :**

- Understand how blockchain systems (mainly Bitcoin and Ethereum) works.
- To securely interact with them.
- Design, build, and deploy smart contracts and distributed applications.
- Integrate ideas from blockchain technology into their own projects.

**Course Outcomes:**

- Interact with a blockchain system by sending and reading transactions.
- Evaluate security, privacy, and efficiency of a given blockchain system.
- Students are able to understand design principles of Bitcoin and Ethereum.
- Learn about Bitcoin, Cryptocurrency, Ethereum
- Identify a use case for a Blockchain application

<b>Module</b>	<b>Sr. NO</b>	<b>Topic and Details</b>	<b>No. of Lectures Assigned</b>	<b>Marks Weightage %</b>
UNIT - I	<b>1</b>	<b>Introduction to Blockchain:</b> Basics of Blockchain, History of Blockchain, Digital Trust, Asset, Transactions, Distributed Ledger Technology, Types of network, Components of blockchain or DLT, Ledger	5	10
	<b>2</b>	<b>Blocks &amp; Cryptography:</b> Blocks-Blockchain, PKI and Cryptography-Private keys, Public keys, Hashing, Digital Signature, Consensus Algorithm-Byzantine Fault, Proof of Work, Proof of Stake	5	10
	<b>3</b>	<b>Security:</b> Security- DDos, Cryptocurrency, Digital Token	3	6
UNIT – II	<b>4</b>	<b>How Blockchain Works :</b> How Blockchain Works, Structure of Blockchain-Block, Hash, Distributed Blockchain	3	6
	<b>5</b>	<b>Lifecycle &amp; elements of Block chain:</b> Lifecycle of Blockchain, Smart Contract, Practical Byzantine, Fault Tolerance, Actors of Blockchain, Blockchain developer, Blockchain operator	4	8
	<b>6</b>	<b>Block Chain Application:</b> Blockchain regulator, Blockchain user, Membership service provider, Building A Small Blockchain Application	3	6

UNIT – III	7	<b>Introduction to Cryptocurrency:</b> Currency, Double Spending Cryptocurrency	3	6
	8	<b>Bitcoin Mining:</b> P2P Payment Gateway, Wallet, Mining	3	6
UNIT – IV	9	<b>Ethereum:</b> Ethereum network, EVM, Transaction fee, Mist, Ether, gas	4	8
	10	<b>Smart contracts &amp; Cryptocurrency in DApps:</b> Solidity - Smart contracts, Truffle, Web3, Design and issue, cryptocurrency, DApps, DAO	5	10
	11	<b>Introduction To Hyperledger Fabric V1.1: Introduction</b> to Hyperledger, What is Hyperledger, Why Hyperledger, Where can Hyperledger be used, Hyperledger Architecture	6	12
<b>TOTAL</b>			<b>50</b>	<b>100</b>

**Text Book:**

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).

**Reference Books:**

1. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies
2. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System
3. Dr. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger," Yellowpaper. 2014.
4. Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on smart contracts

<b>Branch: B.Sc.(IT)</b>	<b>Semester-VI</b>
<b>Subject Code: 6106</b>	<b>Lecture: 04</b> <b>Credit: 04</b>
<b>Course Opted</b>	<b>Discipline Specific Elective -6</b>
<b>Subject Title</b>	<b>CLOUD COMPUTING</b>

**Course Objectives:**

- To understand the concepts of Cloud Computing.
- To learn Taxonomy of Virtualization Techniques.
- To learn Cloud Computing Architecture.
- To acquire knowledge on Cloud Application Platform.
- To learn Industry Cloud Platforms.

**Course Outcomes:**

- Understand the concept of virtualization and how this has enabled the development of Cloud Computing
- Know the fundamentals of cloud, cloud Architectures and types of services in cloud.
- Understand scaling, cloud security and disaster management.
- Design Different Applications in Cloud.
- Explore some important cloud computing driven commercial systems.

<b>Module</b>	<b>Sr. No.</b>	<b>Topic and Details</b>	<b>No. of Lectures Assigned</b>	<b>Marks Weightage %</b>
UNIT- I	1	<b>Introduction to cloud computing</b> , Cloud Computing Advantages & Disadvantages, History of Cloud, Cloud Computing Architecture, Cloud Computing Technologies, Cloud Computing vs Grid Computing, How Cloud works, Cloud Computing Applications, Security Risks of Cloud Computing.	4	8
	2	<b>Types of Cloud</b> Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud, <b>Cloud Service Model:</b> IaaS Layer, PaaS Layer, SaaS Layer.	3	6
	3	<b>Virtualization</b> What is Virtualization, Data Virtualization, Hardware Virtualization, Software Virtualization, Server Virtualization, Storage Virtualization, OS Virtualization Linux Virtualization, Windows Virtualization	4	8
UNIT- II	4	<b>Amazon Web Services</b> Getting started with AWS, AWS Compute, Storage, and Networking, AWS Security, Identity, and Access Management, AWS Database Options, AWS Elasticity and Management Tools	6	12
	5	Architecting on AWS Introduction to System Design: AWS Essentials Review and System Design for High Availability, Automation and Server less Architectures: Event-Driven Scaling, Well-Architected Best Practices: Security, Reliability, Performance Efficiency, Cost Optimization and Deployment and Implementation: Design Patterns and Sample Architectures	5	10

	6	Cloud Security Tools and technologies to secure the data in Private and Public Cloud Architecture. Security Concerns, Legal issues and Aspects, Multi-tenancy issues.	2	4
UNIT –III	7	Cloud Computing Architecture: Introduction, Cloud Reference Model, Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Economics of the Cloud, Open Challenges, Cloud Interoperability and Standards, Scalability and Fault Tolerance.	5	10
	8	Ready for the Cloud: Web Application Design, Machine Image Design, Privacy Design, Database Management, Data Security, Network Security, Host Security, Compromise Response.	4	8
	9	Defining the Clouds for Enterprise: Storage as a service, Database as a service, Process as a service, Information as a service, Integration as a service and Testing as a service.	4	8
UNIT-IV	10	Scaling a cloud infrastructure - Capacity Planning, Cloud Scale. Disaster Recovery: Disaster Recovery Planning, Disasters in the Cloud, Disaster Management.	5	10
	11	Cloud Application Platform Framework Overview, Anatomy of the Aneka Container, From the Ground Up: Platform Abstraction Layer, Fabric Services, Foundation Services, Application Services, Building Aneka Clouds, Infrastructure Organization, Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode, Cloud Programming and Management, Aneka SDK, Management Tools	5	10
	12	Cloud Applications: Scientific Applications – Health care, Geoscience and Biology. Business and Consumer Applications- CRM and ERP, Social Networking, Media Applications and Multiplayer Online Gaming. Google App Engine-Architecture and Core Concepts.	3	6
<b>TOTAL</b>			<b>50</b>	<b>100</b>

**Text Book:**

1. Mastering Cloud Computing by Raj Kumar Buyya, Christian Vecchiola, S.Thamarai Selvi from TMH 2013.
2. George Reese Cloud Application Architectures, First Edition, O'reille Media 2009

**Reference Books:**

- 1) Cloud Computing and SOA Convergence in Your Enterprise A Step-by-Step Guide by David S. Linthicum from Pearson 2010.
- 2) Cloud Computing 2nd Edition by Dr. Kumar Saurabh from Wiley India 2012.
- 3) Cloud Computing – web based Applications that change the way you work and collaborate Online – Michael Miller. Pearson Education.



<b>Branch: B.Sc.(IT)</b>	<b>Semester-VI</b>
<b>Subject Code: 6201</b>	<b>Lecture: 04</b> <b>Credit: 04</b>
<b>Course Opted</b>	<b>Core Course – 21</b>
<b>Subject Title</b>	<b>PROJECT</b>

**Objective:**

The Project work enables students to involve themselves completely to develop their project for solving problems of software industry or any research organization. Doing this will give more exposure to students to handle real life problems of project development. The project covers study of existing system & System Requirements, Analysis, Design and Coding and presentation of result to demonstrate proficiency in the design of research.

**Guidelines:****1. Project Topic:**

1. To proceed with the project work it is very important to select a right topic. Project can be undertaken on any subject addressing IT programme. Research and development projects on problems of practical and theoretical interest should be encouraged.
2. Project work must be carried out by the group of maximum four students and minimum two and must be original.
3. Students can certainly take ideas from anywhere, but be sure that they should evolve them in the unique way to suit their project requirements.
4. The project work can be undertaken in a research institute or organization/company/any business establishment and work professionally and independently to continue to be an entrepreneur. Student must consult internal guide along with external guide (if any) in selection of topic.
5. Head of department and senior staff in the department will take decision regarding selection of projects.

**2. Project Proposal:**

A proposal as per the format given should be prepared once the topic is selected. It should not be more than 3-4 pages and need not be sent separately. The format for the same is:

1. Title of Project
2. Objectives
3. Need for topic and Modules
4. Tools and Technology to be used in Project.
5. Methodology and Procedure of work.
6. Detailed information of Guide (Name, Address, qualification and Experience)

**3. No Objection Certificate:**

If the project is carried out in a company or organization, then a certificate for no objection of same needs to be presented. It should mention that the organization has no objection in publishing the findings of the project study.

The certificate should contain the name of the authority with signature and company stamp and should be given on company's letterhead and duly signed by authorized signatory.

**4. Project Report Format:**

At the end of semester, a student need to prepare a project report (Black book) should be prepared as per the guidelines given by the University and College. Along with project report a

CD containing: project documentation, Implementation code, required utilities, Software's and user Manuals need to be attached.

1. Abstract
2. Introduction
3. Literature Survey
  1. Survey Existing system
  2. Limitation existing system or research gap
  3. Problem Statement and Objectives
  4. Scope
4. Proposed System
  1. Analysis/Framework/ Algorithm
  2. Details of Hardware & Software
  3. Design details (ER Diagram, Data Dictionary, Table Design etc.)
  4. Methodology (your approach to solve the problem)
5. Screenshots
6. Coding
7. Conclusion
8. References

#### **5. Term Work:**

Student has to submit weekly progress report to the internal guide and where as internal guide has to keep track on the progress of the project and also has to maintain attendance report. This progress report can be used for awarding term work marks. Distribution of marks for for term work will be as follows

1. Weekly Attendance on Project Day
2. Project work contribution as per objective
3. Project Report (Hard Bound)
4. Term End Presentation (Internal)

The final certification and acceptance of team work ensures the satisfactory performance on the above aspects.

#### **6. Oral & Practical:**

Oral & Practical examination of Project should be conducted by Internal and External examiners at College Level. Students have to give presentation