Branch: BCA	Semester-VI
Subject Code:6101	Lecture: 04 Credit: 04
Course Opted	Core Course – 18
Subject Title	INTELLECTUAL PROPERTY RIGHTS, PATENTS AND CYBER LAWS

Course Objectives:
- To understand the importance of Intellectual property.
- To gain knowledge of Intellectual property to protect creative work.
- To understand the registration process of various Intellectual Property.
- To learn how to protect intellectual property.
- To understand the concept of cyber law and IT Act.

Course Outcomes:
- Students will learn how to protect their creative work using Intellectual Property Rights.
- Identify the use of Intellectual Property.
- An ability to use Intellectual property to protect their work.
- Understand the registration process of Copyright, Patent and Trademark.

Modules	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage %
UNIT-I	1	**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 Trade Mark, Basic Principles of Design Rights, International Background of Intellectual Property.	5	10
	2	**Information Technology Related Intellectual Property Rights:** **Computer Software and Intellectual Property-** Objective, Copyright Protection, Reproducing, Defences, Patent Protection. **Database and Data Protection-**Objective, Need for Protection, UK Data Protection Act, 1998, US Safe Harbor Principle, Enforcement. **Protection of Semi-conductor Chips-**Objectives, Justification of protection, Criteria, Subject matter of Protection, WIPO Treaty, TRIPs, SCPA. **Domain Name Protection-**Objectives, domain name and Intellectual Property, Registration of domain names, disputes under Intellectual Property Rights, Jurisdictional Issues, and International Perspective.	5	10
	3	**Patents (Ownership and Enforcement):** **Patents**: Objectives, Rights, Assignments, Defences in case of Infringement.	5	10

UNIT-II	4	**Copyright (Ownership and Enforcement): Copyright**: Objectives, Rights, Transfer of Copyright, work of employment Infringement, Defences for infringement.	5	10
	5	**Trademark (Ownership and Enforcement): Trademarks**: Objectives, Rights, Protection of goodwill, Infringement, Passing off, Defences. **Designs**: Objectives, Rights, Assignments, Infringements, Defences of Design Infringement.	5	10
UNIT-III	6	**Enforcement of Intellectual Property Rights**: Civil Remedies, Criminal Remedies, Border Security measures. **Practical Aspects of Licensing**: Benefits, Determinative factors, important clauses, licensing clauses.	5	10
	7	**Cyber Law: Basic Concepts of Technology and Law:** Understanding the Technology of Internet, Scope of Cyber Laws, Cyber Jurisprudence **Law of Digital Contracts:** 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	**Cyber Law: Information Technology Act 2000:** Objectives of IT Act 2000 Following sections to be explained in detail Sections 43(Penalty for damage to the computer), Section 66(Hacking of computer systems), Section 67(publishing of obscene information), Section 72(penalty for breach of privacy), Section 73(penalty for publishing false digital signature certificates).	5	10
	9	**Cyber Law: Intellectual Property Issues in Cyber Space:** Copyright in the Digital Media, Patents in the Cyber World. **Rights of netizens and E-Governance:** Privacy and Freedom Issues in the Cyber World, E-Governance, Cyber Crimes and Cyber Laws, Ethical hacking.	5	10
	10	**Case studies:** Case studies related to different cyber crimes and punishment can be given**.**	5	10
TOTAL			50	100

Text Books:
1. Cyber law by Vivek Sood

Reference Books:
1. Licensing Art & Design by Caryn R. Leland, Allworth Press
2. A Professional's Guide to Licensing and Royalty Agreements by Caryn R. Leland Allworth PressIT2000 Bill
3. How To Register Your Own Copyright by Marx Warda, Sphinx Publishing
4. Web sites: online information, handouts

Branch: BCA	Semester-VI
Subject Code:6102	Lecture: 04 Credit: 04
Course Opted	Core Course – 19
Subject Title	DATA WAREHOUSING AND DATA MINING

Course Objectives:
- Be familiar with mathematical foundations of data mining tools.
- Understand and implement classical models and algorithms in data warehouses and
- data mining
- Characterize the kinds of patterns that can be discovered by association rule
- mining, classification and clustering.
- Master data mining techniques in various applications like social, scientific and environmental context.
- Develop skill in selecting the appropriate data mining algorithm for solving practical problems.

Course Outcomes:
- Understand the functionality of the various data mining and data warehousing component
- Appreciate the strengths and limitations of various data mining and data warehousing models
- Explain the analyzing techniques of various data
- Describe different methodologies used in data mining and data ware housing.
- Compare different approaches of data ware
- housing and data mining with various technologies.

Modules	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage %
UNIT -I	1	**Overview and Concepts**: Need for data warehousing, Basic elements of data warehousing, Trends in data warehousing.	4	8
	2	Data Marts, Data Staging, Meta Data, Data Warehousing & ERP, Data Warehousing & KM, Data Warehousing & CRM.	4	8
	3	**Planning & Project Management:** Life-cycle approach, Collecting the requirements, The Development phases, Dimensional analysis, Dimensional modelling, Star Schema, Snow Flake Schema. Data Design and Data Representation: Principles of dimensional modelling.	6	12
UNIT -II	4	**OLAP:** OLAP Architecture, Relational OLAP, Multidimensional OLAP, Relational Vs Multidimensional OLAP, Web based OLAP.	4	8
	5	**Major features & functions:** Drill down and Roll-up, Slice and Dice or Rotation.	4	8
	6	**Recent Trends in Data Analysis:** Introduction to Data lake and Hybrid Databases	4	8

		Introduction to Big Data: Definition of Big Data, Challenges with Big Data.		
UNIT -III	7	**Data Mining Primitives, Languages, and System Architectures:** Data mining primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems.	6	12
	8	**Data mining Algorithms**: Classification, clustering, association rules. **Knowledge discovery**: KDD process. Decision trees, Neural Networks, Genetic Algorithms.	6	12
	9	**Information Privacy and Data Mining**: Basic principles to protect information piracy, Primary aims of data mining, pitfalls of data mining.	4	8
UNIT -IV	10	**Categories of Web Mining**: Web Content Mining, Web Structure Mining, Web Usage Mining, Applications of Web Mining, and Agent based and Data base approaches, Web mining Software.	4	8
	11	**Search Engines**: Characteristics, Functionality, Architecture, Ranking of web pages, the search engine industry, the enterprise search.	2	4
	12	**Data mining applications**: Benefits of data mining, Applications in Retail industry, Applications in Telecommunications Industry, Applications in Banking and Finance.	2	4
TOTAL			**50**	**100**

Text Books:

1. Data Warehousing Fundamentals – Paulraj Ponnaiah, Wiley student Edition
2. Han, Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann.

Reference Books:

1. Alex Berson, S.J. Smith, "Data Warehousing, Data Mining and OLAP", Tata McGraw Hill
2. Margaret Dunham, "Data Mining: Concepts and Techniques", Morgan Kaufmann Pub.
3. Ralph Kimball, "The Data Warehouse Lifecycle toolkit', John Wiley.
4. Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", 2nd edition, Morgan Kaufmann, ISBN 1558609016, 2006.
5. A B M Shaukat Ali, Saleh A Wasimi, "Data Mining: Methods and Techniques", Cengage Learning Pub.

Branch: BCA	Semester-VI
Subject Code: 6103	Lecture: 02 Credit: 02
Course Opted	Skill Enhancement Course - 3
Subject Title	INTERNET OF THINGS (IOT)

Course Objectives:
- To learn about IOT concepts and its Applications
- To learn various domains in IOT

Course Outcomes:
- Enable learners to understand System On Chip Architectures.
- Enable to learn ArduinoOpen Source Platform with hardware and installation.
- To develop physical interfaces and electronics of Raspberry Pi and program them using hand- on- training.

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weight age %
UNIT - I	1	**Introduction to IOT**, Features, IOT Applications, Advantages and Disadvantages, IOT Architecture & Domains, Components of IOT.	4	8
	2	IOT Devices, Technology, Protocols, Hardware and Software, Applications and its Usages	4	8
	3	IOT Testing, Analytics, IOT Ecosystem, IOT Platforms, IOT Communications: Data Link, Network Layer, Session Layer,	4	8
UNIT - II	4	**Open – Source Prototyping Platforms for IoT:** Basic Arduino Programming Extended Arduino Libraries, Arduino – Based Internet Communication, Raspberry PI, Sensors and Interfacing. **IoT Technology:** RFID + NFC, Wireless Networks + WSN, RTLS + GPS, Agents + Multi – Agent Systems, Composition Models for the Web of Things and resources on the Web, Discovery, Search, IoTMashups and Others. **Wireless Sensor Networks:** History and Context, The Node, Connecting Nodes, Networking Nodes, Secured Communication for IoT.	6	12
	5	**Data Management, Business Process and Analytics:** Data Management, Business Process in IoT, IoT Analytics, Creative Thinking Techniques, Modification, Combination Scenarios, Decentralized and Interoperable Approaches, Object – Information Distribution Architecture, Object Naming Service (ONS), Service Oriented Architecture, Network of Information, Etc.	7	14

		Application and Use Cases: Concrete Applications and Use – Cases of Web Enabled Things: Energy Management and Smart Homes, Ambient Assisted Living, Intelligent Transport, Etc. M2M, Industrial IoT Applications.		
		TOTAL	**25**	**50**

Text Books:

1. The Internet of Things (MIT Press) by Samuel Greengard.
2. The Internet of Things (Connecting objects to the web) by Hakima Chaouchi ,Wiley .
3. Internet of Things (A Hands-on-Approach) by Arshdeep Bhaga and Vijay Madisetti.

Reference Books:

1. The Internet of Things Key applications and Protocols, 2nd Edition, (Wiley Publication) by Olivier Hersent, David Boswarthick and Omar Elloumi.
2. IoT –From Research and Innovation to Market development, River Publication by Ovidiu Vermesan and Peter Friess.
3. Building Internet of Things with Arduino by Charalampos Doukas.

Branch: BCA	Semester-VI
Subject Code:6104	Lecture: 04 Credit: 04
Course Opted	Discipline Specific Elective – 4
Subject Title	MACHINE LEARNING

Course Objectives:
- To introduce students to the basic concepts and techniques of Machine Learning.
- To become familiar with regression methods, supervised and unsupervised learning
- To become familiar with the Applications of Machine Learning Algorithms

Course Outcomes:
- Gain knowledge about basic concepts of Machine Learning
- Identify machine learning techniques suitable for a given problem
- Solve the problems using various machine learning techniques
- Apply Dimensionality reduction techniques.
- Design application using machine learning techniques

Modules	Sr. No.	Topic and Details	No. of Lectures Assigned	Marks Weightage %
UNIT -I	1	**Introduction to Machine Learning**: History of Machine Learning, Introduction and installation of Python, NumPy and SciPy.	4	8
	2	**Introduction and installation of Matplotlib, SymPy, Mathematical Foundations:** L1 and L2 form, Type of Matrixes, Eigenvector and eigenvalues, Singular-Value Decomposition.	6	12
	3	Formation of Mean, Median, Mode, Confusion Matrix, Bias and Variance	5	10
UNIT -II	4	**Linear regression**: Meaning, Ordinary Least Squares Regression (OLSR), over fitting, Multivariate Adaptive Regression Splines (MARS).	5	10
	5	**Logistic Regression**: Meaning, Regularization, Regularized Linear Regression, Regularized Logistic Regression.	5	10
UNIT -III	6	**Supervised Learning**: Decision tree, Support Vector Machine (SVM).	5	10
	7	Random forest, Naive Bayes, and k-nearest neighbor, Neural Network.	5	10
UNIT -IV	8	**Unsupervised Learning:** k-means Clustering, Hidden Markov Model, DBSCAN Clustering.	5	10

9	**Unsupervised Learning**: PCA, t-SNE, SVD, Association rule.	5	10
10	**Applications of Machine Learning Algorithms:** Virtual Personal Assistants**,** Siri, Alexa, Google Home, Face Recognition, Email Spam and Malware Filtering etc.	5	10
	TOTAL	**50**	**100**

Text Books:

1. Dr. Nilesh Shelke, Dr. Narendra Chudhari, Dr. Gopal Sakarkar "Introduction to Machine Learning ", DAS GANU PRAKASHAN
2. Dr. A Krishna Mohan, Dr. T Murali Mohan, Karunakar," Pyhton with Machine Learning", S. Chand Prakashan

Reference Books:

1. Introduction to machine learning, Ethem Alpaydin. —2nd ed., The MIT Press, Cambridge, Massachusetts, London, England.
2. Introduction to artificial neural systems, J. Zurada, St. Paul: West.
3. Machine Learning, Tom M Mitchell.

Branch: BCA	Semester-VI
Subject Code:6104	Lecture: 04 Credit: 04
Course Opted	Discipline Specific Elective - 5
Subject Title	BLOCKCHAIN TECHNOLOGY

Course Objectives:

- To understand what Blockchain is and why it is used
- To be able to explain the different components involved within Blockchain
- To know when and why to use Blockchain within an environment
- To understand cryptocurrency and hashing algorithms
- To apply blockchain optimization and enhancements technique to improve security and applications.

Course Outcomes:

- Explain cryptographic building blocks and reason about their security.
- Define Bitcoin's consensus mechanism. The immutable blockchain and appreciate how security comes from a combination of technical methods and clever incentive engineering.
- Learn how the individual components of the Bitcoin protocol make the whole system works: transactions, script, blocks, and the peer-to-peer network.
- Exploit applications of Blockchain in real world sceneries.

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction:** Definition and concepts, History, How blockchain is different from databases, nodes, cryptocurrency, Tokens, Motivation behind blockchain, characteristics of blockchain.	3	5
	2	**Overview:** Background of DLT, **Types of Blockchain:** (public (permissionless), private (permissioned) and consortium), **Overview of Blocks:** (Block attributes, Structure of block, block header, Linking block) Influence of Moore's Law on Blockchain technology.	4	10
UNIT-II	3	**Cryptography:** Concepts, Classical Cryptography, Cryptographic Primitives, **Symmetric key cryptography:** (Stream, Cipher, Block cipher, Data Encryption Standard (DES), Advanced Encryption Standard (AES), An example implementation of AES)	8	10

		Content		
		Asymmetric key cryptography: (Prime Factorization, Discrete logarithm, Eliptic – curve, RSA algorithm).		
	4	**Hashing:** **Hashing Algorithms:** (Message Digest, SHA, Hashing example using an SHA -256 algorithm) Merkle Hash Trees, Encoding Schemes.	5	10
	5	**Digital Signatures:** Working, Signing Process, Verification Process, Creating an identity, Signature in transaction, asset ownership in blockchain – (Transferring an asset, Transmitting the transaction, claiming the asset), Blockchain Wallet.	5	5
UNIT-III	6	**Networking in Blockchain:** **Peer – to – Peer (P2P) networking:** (History of P2P network, P2P networking architecture), Network Discovery, Block Synchronization **Cryptocurrency:** (Basics, Key and address, Transactions, Mining and Consensus, Block Structure and Merkle Trees, Blockchain Networks viz. Testnet, Regtest and Bitcoin hard forks and altcoins).	5	10
	7	**Blockchain Optimization and Enhancements:** **Blockchain Optimization:** Transaction Exchange, Off-chain Transactions, Block size improvements **Blockchain Enhancements:** **Sharding** – (Components, Design and Cross – shard Communication), **Evolution of consensus algorithm** – (Proof of Stack (PoS), Proof of Activity (PoA)) **Byzantine Fault Tolerance (BFT) consensus models** – (Practical Byzantine Fault Tolerance (PBFT), Federated Byzantine Fault Tolerance (FBFT)).	8	15
UNIT-IV	8	**Blockchain Security:** **Transaction Security Model:** (Risks of the Security model) **Decentralized Security Model:** (Centralization due to cryptocurrency exchange, Centralization in mining pool) **Attacks on the Blockchain:** (Double-spend attacks, 51% attack, Eclipse attacks) Threats of Quantum Computing,	7	15

	9	**Limitations and Use cases of Blockchain:** **Limitations:** (Slower Process, Scalability, High Energy Consumption, Immutability, Inefficient, Self - Maintenance, High Cost, Maturity, Interoperability and Integration). **Use Cases of Blockchain:** (Tracking provenance in the supply chain, Financial System, Crow funding, Non – Profit autonomous organizations)	5	10
		TOTAL	**50**	**100**

Text Books:
1. Koshik Raj, Foundations of Blockchian, Packt, Birmingham, Mumbai
2. Atul Kahate, Cryptography and Network Security, McGraw Hill

Reference Books:

1. Kaufman, C., Perlman, R.,& Speciner, M., .Network Security, Private Communication in a Public world, 2nd ed., Prentice Hall PTR, 2002
2. Stallings, W., Cryptography and Network Security: Principles and Practice, 3rd ed., Prentice Hall PTR., 2003
3. Stallings, W., Network Security Essentials: Applications and Standards, Prentice Hall, 2000
4. Van Haren, Introduction to Blockchain Technology, Van Haren Publishing,20 October 2019 by Melanie Swan, Blockchain, O'Reilly; 1 edition, 6 February 2015
5. Clarke, A.C., "Hazards of Prophecy: The Failure of Imagination," from *Profiles of the Future: An Inquiry into the Limits of the Possible*, 1962.
6. Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System", https://bitcoin.org/bitcoin.pdf
7. Gautam N. Ramamoorthy, Samiha Z. Khan, "BITCOIN: BLOCKCHAIN BASED PEER TO PEER PAYMENT SYSTEM",2020 IJRAR March 2020, Volume 7, Issue 1, http://www.ijrar.org/papers/IJRAR2001834.pdf

Branch: BCA	Semester-VI
Subject Code:6104	Lecture: 04 Credit: 04
Course Opted	Discipline Specific Elective - 6
Subject Title	BIG DATA AND CLOUD COMPUTING

Course Objectives:
- To provide learners with the comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture, implantations and applications.
- To provide sufficient foundations of cloud computing.

Course Outcomes:
- Learners will be able to articulate the main concepts, key technologies, strengths, and limitations of cloud computing.
- Learners will be able to apply form state-of-the-art cloud computing using open source technology.
- Learner will be able to identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
- Learner will be able to explain the core issues of cloud computing such as security, privacy, and interoperability.

Modules	Sr. No.	Topic and Details	No of Lectures Assigned	Marks Weightage %
UNIT-I	1	**Introduction to Big Data:** Characteristics of Data, Evolution of Big Data, Definition of Big Data, Challenges with Big Data, What is Big Data?, Other Characteristics of Data, Why Big Data?, Information?, Traditional Business Intelligence (BI) versus Big Data.	7	14
	2	**Introduction of Hadoop and its Installation:** Modules, history, Ecosystem, Architecture, advantages and disadvantages, Analytics Tools, Components and Domain. MapReduce	6	12
UNIT-II	3	**Introduction to Cloud Computing**: Characteristics and benefits of Cloud Computing, Advantages and disadvantages, History, Architecture: The cloud reference model. Infrastructure as a service. Platform as a service. Software as a service. Types of clouds. Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages.	7	14
	4	**Virtualized Environments:** Taxonomy of Virtualization Techniques. Virtualization and Cloud Computing. Pros and Cons of Virtualization. Cloud service Providers. - CLOUD APPLICATIONS Technologies and the processes required when deploying web services; Deploying a	6	12

		web service from inside and outside a cloud architecture, advantages and disadvantages.		
UNIT-III	5	**Cloud IT Model:** Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service, applications and development platform deployment so as to improve the total cost of ownership (TCO).	6	12
	6	**Introduction to OpenStack**: OpenStack test-drive, Basic OpenStack operations, OpenStack CLI and APIs, Tenant model operations, Quotas, Private cloud building blocks.	6	12
UNIT-IV	7	**Deployment:** Controller deployment, Networking deployment, Block Storage deployment, Compute deployment, deploying and utilizing OpenStack in production environments, building a production environment, Application orchestration using OpenStack Heat.	6	12
	8	**Apache Spark:** Introduction, Architecture, Components, Spark RDD, in-built Functions. AWS Web services, Services: Computer, Network, Storage, Database, Analytics, Applications SSH using putty and filezilla.	6	12
TOTAL			**50**	**100**

Text Books:
1. Mastering Cloud Computing, Rajkumar Buyya, Christian Vecchiola, S ThamaraiSelvi, Tata McGraw Hill Education Private Limited, 2013.
2. OpenStack in Action, V. K. CODY BUMGARDNER, Manning Publications Co, 2016

Reference Books:
1. OpenStack Essentials, Dan Radez, PACKT Publishing, 2015.
2. OpenStack Operations Guide, Tom Fifield, Diane Fleming, Anne Gentle, Lorin Hochstein, Jonathan Proulx, Everett Toews, and Joe Topjian, O'Reilly Media, Inc., 2014https://www.openstack.or

Branch: BCA	Semester-VI
Subject Code:6105	Lecture: 12 Credit: 06
Course Opted	Core Course - 20
Subject Title	PROJECT

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 and demonstration on the Project.