IPS Academy, Institute of Engineering & Science

(A UGC Autonomous Institute, Affiliated to RGPV, Bhopal)

Scheme Based on AICTE Flexible Curriculum

Department of Computer Science & Engineering

Bachelor of Technology (B.Tech.)

[Computer Science & Engineering (IOT and Cyber Security Including Block Chain Technology)] (CSITCS)

V-Semester

Sr. No.	Course Type	Course Code	Course Title	Scheme			Credits
				L	T	P	
1	PCC	CB08	Internet of Things and Applications	2	1	–	3
2	PCC	CB09	Database management system	2	1	–	3
3	PCC	CB10	Cyber Security and Cryptography	2	1	–	3
4	PCC	CB11	Software Engineering & Project Management	2	1	–	3
5	HSMC	HS05	Humanities and Social Sciences Open Courses-I	2	–	–	2
6	IFC	AL01	Interdisciplinary Foundation Course-II	2	–	–	2
7	LC	CB08(P)	Internet of Things and Applications Lab	–	–	2	1
8	LC	CB09(P)	Database management system Lab	–	–	2	1
9	SBC	CB02(P)	Unix and Network Programming	–	–	4	2
10	PROJ	CB01	Mini Project	–	–	4	2
11	MLC	MLC03	Environmental Studies	1	–	–	0
12	LLC	LLC03	Liberal Learning Course –III	–	–	2	0
13	PROJ		Internship-I	Credit to be added in Sixth Semester.			
Total Academic Engagement and Credits				**13**	**4**	**14**	**22**
				29			

- **Humanities and Social Sciences Open Courses – I**
  - (A) English Language Proficiency
  - (B) German Language
  - (C) French Language
  - (D) Japanese Language
  - (E) Soft skill and Interpersonal Communication

- **Interdisciplinary Foundation Course-II (IFC-AL01)**
  (Offered by CSE (AIML) Branch)
  - (A) Foundation of AIML

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PCC-CB08	Internet of Things and Applications	2L: 1T: 0P (3hrs.)	3 Credits

Pre requisite: Basic Electronics.

Course Objective: Students will be explored to the interconnection and integration of the physical world and the cyber space.

Course Contents: (40 hrs.)

Module 1: **(06hrs.)**

Introduction to Internet of Things, Physical Design of IOT, Logical Design of IOT, IOT Enabling Technologies, IOT Levels. Definition and Characteristics of IoT, embedded system vs IoT, Overview of Governance, Privacy and Security Issues, Applications of IoT.

Module 2: **(08hrs.)**

Acoustic Sensors: Microphone characteristics - Resistive Microphones - Condenser Microphones - Fiber-Optic Microphone - Piezoelectric Microphones - Electret Microphones –dynamic microphones Humidity and moisture sensors : Concept of Humidity - Capacitive Sensors -Resistive sensors - Thermal Conductivity Sensor - Optical Hygrometer Oscillating Hygrometer - Soil Moisture.

Module 3: **(10hrs.)**

Pressure Sensors: Concepts of Pressure - Units of Pressure - Mercury Pressure Sensor -Bellows, Membranes, and Thin Plates - Piezoresistive Sensors - Capacitive Sensors Optoelectronic Sensors – Indirect pressure sensors -Vacuum Sensors Flow Sensors - Basics of Flow Dynamics - Pressure Gradient Technique - Thermal Transport Sensors - Ultrasonic Sensors -Electromagnetic Sensors. - Microflow Sensors - Breeze Sensor - Coriolis Mass Flow Sensors - Drag Force Flow Sensors – Dust and smoke detectors.

Module4: **(08hrs.)**

Temperature Sensors-Thermo-resistive Sensors - Resistance Temperature Detectors - Silicon Resistive Sensors - Thermistors -NTC Thermistors -Self Heating Effect in NTC Thermistors - PTC Thermistors - Thermoelectric Contact Sensors - Semiconductor P-N Junction Sensors - Optical Temperature Sensors - Temperature Sensor - Piezoelectric Temperature Sensors. Light Detectors: Introduction - Photodiodes - Phototransistor –Photoresistors - Cooled Detectors -Imaging sensors -UV detectors - Thermal Radiation Detectors.

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Module5: **(08hrs.)**

Importance of actuators, types: Pneumatic actuators, Hydraulic actuators, Electric actuators, Thermal actuators. Case studies of IoT system containing sensor devices and use of Actuators.

Course Outcome:

1. Understand basic of Internet of Things, its governance and applications.
2. Outline the physical principles behind acoustic sensors and their usage.
3. Identify different pressure and flow detectors for sensing.
4. Understand different types of temperature, acoustic and light sensors.
5. Understand concept of actuators and their features.

List of Text/Reference Books:

1. Vijay Madisetti, Arshdeep Bahga, “Internet of Things: A Hands-On Approach”
2. Peter Waher, 'Learning Internet of Things', Packt Publishing, 2015 3. Editors Ovidiu Vermesan
3. Jacob Fraden, “ Handbook of Modern Sensors – Physics, Designs and Applications”
4. Springer fifth edition, 2016
5. John Vetelino and Aravind Reghu, “Introduction to Sensors” CRC Press, 1st Edition, 2010.
6. Ion Sinclair,” Sensors and tranducers” Newnws publisher, Third Edition, 2001

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V-Semester

PCC-CB-09	Data Base Management System	2L: 1T: 0P (3hrs.)	3 Credits

Pre requisite: Basics of Computer.

Course Objective: The main objective of this course is to understand fundamentals of database management system.

Course Contents:

Module1: **(06 hrs.)**

Introduction to DBMS, File system vs DBMS, Advantages of database systems, Database System architecture, Data models, Schemas and instances, Data independence, Functions of DBA and designer, Design issues, Entity-Relationship model :Basic concepts, Design process, E-R diagrams, weak entity sets, extended E-R features –generalization, specialization and aggregation.

Module2: **(08 hrs.)**

Structure of relational databases, Domains, Relations, Relation algebra – fundamental operators and syntax, relational algebra queries, Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations, Integrity constraints, Referential integrity, Keys.

Module3: **(10 hrs.)**

Data definition in SQL, update statements and views in SQL: Data storage and definitions, Data retrieval queries and update statements, Query Processing & Query Optimization: Overview, measures of query cost, selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans. Case Study of ORACLE and DB2.

Module4: **(08 hrs.)**

Functional Dependency –definition, trivial and nontrivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization –1NF, 2NF,3NF, Decomposition using FDdependency preservation, lossless join, BCNF, Multi-valued dependency, 4NF, Join dependency and 5NF.

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V-Semester

Module5: (06 hrs.)

Introduction of transaction, transaction processing and recovery, Concurrency control: Lock management, specialized locking techniques, concurrency control without locking, Protection and Security Introduction to: Distributed databases, Basic concepts of object oriented data base system.

Course Outcome:

1. Describe basic concepts of DBMS and Explain ER model.
2. Solve queries using Relational Algebra and Extended ER features
3. Analyze and renovate to use a DDL, DML, Data Retrieval Query and discuss the Query optimization methods.
4. Understanding of functional dependencies, normalization theory and apply knowledge to the design of a database.
5. Explain term like transaction processing, concurrency control and distributed database.

List of Text/Reference Books:

1. Date C J, “An Introduction to Database System”, Pearson Educations, 8th Edition, 2003.
2. Korth, Silbertz, Sudarshan, “Fundamental of Database System”, McGraw Hill, 5th Edition, 2006.
3. Peter Rob, “Data Base System: Design Implementation & Management”, Cengage Learning 4th Edition, 2000.
4. Elmasri, Navathe, “Fundamentals of Database Systems”, Pearson Educations, 7th Edition 2017.
5. Atul Kahate, “Introduction to Database Management System”, Pearson Educations, 2004.
6. Oracle 9i Database Administration Fundamental-I, Volume I, Oracle Press, TMH.
7. Paneerselvam,”DataBase Management System”, PHI Learning, 3rd Edition, 2018.
8. J. D. Ullman, “Principles of Database and Knowledge – Base Systems”, Computer Science Press, 2nd Edition 1988.
9. Serge Abiteboul, Richard Hull, Victor Vianu, “Foundations of Databases”, Addison-Wesley, 1995.

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V-Semester

PCC-CB-10	Cyber Security and Cryptography	2L: 1T: 0P (3hrs.)	3 Credits

Pre requisite: Nil.

Course Objective: Analyze and resolve security issues in an organization to secure an IT infrastructure.

Course Contents: (40 hrs.)

Module1: **(06hrs.)**

Introduction of Cyber Crime, Challenges of cyber crime, Classifications of Cybercrimes: E- Mail Spoofing, Spamming, Internet Time Theft, Salami attack/Salami Technique. Information Security: security needs, security trends, security attacks.

Module2: **(08hrs.)**

Web jacking, Online Frauds, Software Piracy, Computer Network Intrusions, Password Sniffing, Identity Theft, cyber terrorism, Virtual Crime, Perception of cyber criminals: hackers, insurgents and extremist group etc. Symmetric ciphers: classical encryption techniques, substitution techniques, transposition techniques.

Module3: **(14hrs.)**

Public key encryption and hash functions: public key cryptography, RSA algorithm, key management, Diffie- Hellman key exchange, message authentication and hash functions, digital signatures and authentication protocols, Kerberos, Digital envelope and Digital Certificates. Cyber Crime and Criminal justice.

Module4: **(09hrs.)**

Trends in Internet crime: historical hacking techniques, denial of service attacks, flood attacks, distributed DOS, spoofing, spoofing tools, sniffers, sniffer programs, detection and protection against sniffer.

Module5: **(08hrs.)**

Introduction to IP security: architecture, authentication header and ESP. Web security: Secure Socket Layer and Transport Layer Security. Email security: PGP, Vulnerabilities: vulnerability detection,

language vulnerabilities, window vulnerabilities, Linux vulnerabilities.

Course Outcome:

1. Define and explain the concepts of cyber crime and its classification.
2. Delineate the components online frauds, intrusions, virtual crimes and hacking.
3. Knowledge of different act's in cyber security.
4. Classify different types of hacking techniques. Experiment with different sniffing tools. What are Trojans and viruses?
5. Explain IP Security, PGP and SSL protocols. Illustrate vulnerabilities of Linux, Windows and language.

List of Text/Reference Books:

1. Jonathan Clough, "Principles of Cybercrime", Cambridge University Press, 2nd Edition, 2015.
2. John R. Vacca, "Computer Forensics: Computer Crime Scene Investigation", Charles River Media, 2nd Edition, 2005.
3. William Stallings, "Cryptography and Network Security" 5th edition, Pearson Education.
4. Atul Kahate. "Cryptography and Network Security" 3rd edition Tata McGraw-Hill. NIIT, "

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V-Semester

PCC-CB11	Software Engineering & Project Management	2L: 1T: 0P (3hrs.)	3 Credits

Prerequisite: Basic computer skills.

Course Objective: The purpose of this subject is to cover the underlying concepts and techniques used in SoftwareEngineering & Project Management.

Course Contents: (40 hrs.)

Module 1: **(08hrs.)**

The Software Product and Software Process

Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model,Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics, Feasibility Analysis, CostEstimation Model.

Module 2: **(08hrs.)**

Requirement Elicitation, Analysis, and Specification

Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability.

Module 3: **(08hrs.)**

Software Design

The Software Design Process, Design Concepts and Principles, Software Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Function- oriented Design, SA/SD Component Based Design and Design Metrics.

Module 4: **(08hrs.)**

Software Analysis and Testing

Software Static and Dynamic analysis, Code inspections, Software Testing, Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, Test Oracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit, Testing Frameworks, Integration Testing, System Testing and other Specialized, Testing, Test Plan, Test Metrics, Testing Tools.

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V-Semester

Module 5: **(08hrs.)**

Software Maintenance & Software Project Measurement

Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support. Project Management Concepts, Project and Process Planning, Resources Allocations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance (SQA). Project Plan, Project Metrics.

Course Outcomes:

1. Decompose the given project in various phases of a lifecycle.
2. Choose appropriate process model depending on the user requirements.
3. Perform various life cycle activities like Analysis, Design, Implementation, Testing & Maintenance.
4. Know various processes used in all the phases of the product.
5. Apply the knowledge, techniques, and skills in the development of a software product

List of Text / Reference Books:

1. Pankaj Jalote , "An Integrated Approach to Software Engineering", Narosa Pub, 2005.
2. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning, Fouth Edition, 2014.
3. P, S. Pressman "Software Engineering. A Practitioner's Approach" New edition, McGrawHills, 7th edition, 2010.
4. Sommer ville, "Software Engineering", Pearson Education, 9th Edition, 2011.
5. Richard H.Thayer, "Software Engineering & Project Managements", Wiley India
6. Waman S. Jawadekar, "Software Engineering", TMH, 2004.
7. Bob Hughes, M. Cotterell, Rajib Mall "Software Project Management", Mc Graw Hill, Sixth Edition,2017
8. Schwalbe, Kathy "Information Technology Project Management" 8th Edition, 2016.
9. Kieron Conway "Software project Management from concept to development Black Book" Dream tech Press.
10. Deepak Jain, "Software Engineering principle and practices" Oxford UniversityPress, 2008.
11. Bell Douglas "Software Engineering for students" ,Pearson Education.,4th Edition,2005.
12. Kelkar "Software Project Management," PHI Learning,3rd edition 2012.

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V-Semester

IFC-AL-01	**Foundation of Artificial Intelligence and Machine Learning**	**2L: 0T: 0P (2hrs.)**	**2 Credits**

Course Objective: The objective of this course is to understand fundamental of AI & ML with Block Chain Technology.

Course Contents: (22 hrs.)

Module 1: **(04hrs.)**

Introduction to Artificial Intelligence, Need of AI, Goals of AI, Applications of AI, Types of AI, Basic Problem Solving: Informed & Uninformed Search algorithms, Hill CLimbing Algorithm.

Module 2: **(05hrs.)**

Working of machine learning, Machine Learning Life Cycle, Datasets & Data preprocessing, Types of learning methods: Supervised Learning, Unsupervised Learning, Reinforcement Learning, Some basic supervised learning algorithms: Linear Regression & K Nearest Neighbors.

Module 3: **(05hrs.)**

Software Design

Blockchain Technology: Introduction, Need of blockchain (solving double spending), Public Key Cryptography, Hashing, Blockchain vs Database, Blockchain Data Management, Limitations of Blockchain.

Module 4: **(04hrs.)**

Bitcoin: An application of Blockchain Technology, Basic Components of Bitcoin, Bitcoin mining & role of miners, Chaining of blocks & Distributed ledger, Privacy in Bitcoin system.

Module 5: **(04hrs.)**

Introduction to various online tools & python libraries, Demonstration of Case studies using Kaggle online tool: Predicting House Prices using Boston Housing Dataset & Performing K-NN algorithm on Iris Dataset.

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V-Semester

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

1. Identifying Needs & Uses of AI & ML in the modern world.
2. Getting Acquainted with Blockchain Technology & Understanding its working
3. Studying an application of Blockchain i.e. Bitcoin.
4. Understanding Practical implementation of Machine Learning
5. Working with a few popular case studies pertaining to Machine Learning

List of Text / Reference Books:

1. Artificial Intelligence: Elaine Rich, Kevin Knight, Mc-GrawHill.
2. Introduction to AI & Expert System: Dan W.Patterson, PHI.
3. The Hundred-Page Machine Learning Book: Andriy Burkov
4. BASICS OF BITCOINS & BLOCKCHAINS: An Introduction to Cryptocurrencies and the Technology that Powers Them: Anthony Lewis
5. Blockchain Basics: A Non-Technical Introduction in 25 Steps.

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V-Semester

LC-CB08	Internet of Things and Applications Lab	0L: 0T: 2P (2hrs.)	1 Credit

Pre requisite: Basic Electronics

Course Objective: They are also able to design & develop IOT Devices.

Course Contents:

Module 1: **(04hrs.)**
Sensor vs Sensor module, PIR and IR Sensor, PCB Mounted Active Buzzer Module, Servo motor, LCD, I2C module.

Module 2: **(04hrs.)**
Ultrasonic Sensor, Stepper motor, RGB LEDs, LDR sensors.

Module 3: **(04hrs.)**
Gas and Dust Sensor, Flame Sensor, Temperature & Humidity Sensor, Water TDS, pH, Flow, Level and Pressure Sensor.

Module 4: **(04hrs.)**
RFID cards, Tags & Readers: working principle, frequency ranges: Low Frequency, High Frequency, and Ultra-High Frequency, Types: Active RFID, Passive RFID.

Module 5: **(06hrs.)**
Distance Sensor, Light/Color Sensor, Motor Driver, BO motor, sound sensor.

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V-Semester

Course Outcome:

1. Understand the importance of different IR sensors.
2. Identify working of Ultrasonic and LDRs.
3. Bring out the different types of temperature, acoustic, humidity & moisture sensors.
4. Outline the physical principles behind RFID
5. Bring out the different types of Distance, Sound sensors and motors.

List of Text/Reference Books:

1. Jacob Fraden, "Handbook of Modern Sensors – Physics, Designs and Applications" Springer fifth edition, 2016.
2. John Vetelino and Aravind Reghu, "Introduction to Sensors" CRC Press, 1st Edition, 2010.
3. Ion Sinclair," Sensors and transducers" Newnws publisher, Third Edition, 2001.

List of Experiments:

Creating the following mini project using required sensors and actuators:

1. Car Parking System.
2. Burglar Alarm with PIR Motion Sensor.
3. Smart Street light system.
4. Smart Dustbin.
5. LPG detector and auto exhaust.
6. Soil Moisture Detection.
7. Water Pressure & Flow Control system.
8. Smart toll tax system.
9. Acoustic Sensors home automation.
10. Line sensor car.

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V-Semester

LC-CB09	Data Base Management System Lab	0L:0T:2P (2hrs.)	1Credit

Prerequisite: Nil.

Course objective: The main objective of this course is to understand fundamentals of database management system.

Course Contents:

Module 1: **(04hrs.)**

DBMS Concepts and architecture Introduction, Database approach v/s Traditional file accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Overall Database Structure, Functions of DBA and designer, ER data model: Entitles and attributes, Entity types, Defining the ER diagram, Concept of Generalization, Aggregation and Specialization, Transforming ER diagram into the tables.

Module 2: **(04hrs.)**

Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints. Referential integrity, Relational Query languages: SQL-DDL, DML, integrity constraints, Complex queries, various joins, Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations.

Module 3: **(04hrs.)**

Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multivalued dependencies. Query Optimization: Introduction, steps of optimization, various algorithms to implement select, project and join operations of relational algebra.

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V-Semester

Module 4: **(04hrs.)**

Transaction Processing Concept: Transaction system, Testing of Serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery. Checkpoints deadlock handling. Concurrency Control Techniques: Concurrency Control, locking Techniques for concurrency control, time stamping protocols for concurrency control, validation-based protocol, multiple granularity.

Module 5: **(06hrs.)**

Study of Relational Database Management Systems through Oracle/PL SQL/MySQL: Architecture, physical files, memory structures, background process. SQL queries, Dataextraction from single, multiple tables equi-join, non equi-join, self-join, outer join. Usage of like, any, all, exists, in Special operators. User defined functions their limitations. Triggers, mutating errors, instead of triggers.

Course Outcome:

1. Describe basic concepts of DBMS and Explain ER model.
2. Solve queries using Relational Algebra, Relational Calculus and SQL.
3. Explain database schema and discuss the Query optimization methods.
4. Describe transaction processing, concurrency control and recovery technique.
5. Analyze the Various DBMS software like Oracle, SQL/PL SQL etc.

List of Text/ Reference Books:

1. Date C J, “An Introduction to Database System”, Pearson Educations, 8th Edition, 2003.
2. Korth, Silbertz, Sudarshan, “Fundamental of Database System”, McGraw Hill, 5th Edition,2006.
3. Peter Rob, “ Data Base System: Design Implementation & Management”, Cengage Learning, 4th Edition,2000.
4. Elmasri, Navathe, “Fundamentals of Database Systems”, Pearson Educations,7th Edition, 2017.
5. Atul Kahate ,“ Introduction to Database Management System”, Pearson Educations,2004.
6. Oracle 9i Database Administration Fundamental-I, Volume I, Oracle Press, TMH.
7. Paneerselvam, “Database Management System”, PHI Learning,3rd Edition,2018.
8. J. D. Ullman, “Principles of Database and Knowledge – Base Systems”, Computer Science Press,2nd Edition 1988.
9. Serge Abiteboul, Richard Hull, Victor Vianu, “Foundations of Databases”, Addison-Wesley,1995.

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V-Semester

List of Experiments:

1. Introduction to Oracle and SQL.
2. Write the queries for Data Definition language (DDL).
3. Write the queries for Data manipulation language(DML).
4. Use of various types of Integrity Constraints.
5. Write the queries for Data Control language (DCL).
6. Use of SELECT command with different clauses.
7. Write SQL queries using logical operation (AND, OR,NOT).
8. Write SQL queries for aggregate functions (Max, Min, Sum, Avg, and Count).
9. Write SQL queries for group by and having.
10. Write SQL queries for sub queries and nested queries.
11. Write an SQL query to implement JOINS.
12. Write SQL queries to create views.
13. Write program by the use of PL/SQL.
14. Design and implementation of any Database system (like Banking, University etc.).

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V-Semester

SBC-CB-02	Unix and Network Programming	0L:0T:4P (4hrs.)	2 Credit

Prerequisite: Programming in C & Basic knowledge of DOS commands.

Course Objective:

1. Understand Kernel Basics.
2. Understand use of different commands.
3. Understand file operations as carried by Linux O.S.
4. To develop the basic skills required to write User Administration tasks.
5. Implementation of Shell Scripting in Linux Environment.

Module 1: **(04hrs.)**

Basics of Linux/ Unix, History of Linux. Difference Between Linux and Windows. Difference Between Linux and Unix. GNU. Why Linux is Virus proof? Various Linux Distributions. Hardware Requirements for Unix/Linux. Features of Linux/Unix Operating System, Kernel, Kernel Functions. Who, why & what is root. What is Shell & Shell Variables, Basic commands i.e. mkdir, touch, ls, pwd, cd, chmod, df, du, dd, adduser, sort, passwd, rm/rmdir, date, tar, gzip , top. Editors,Vi Editor.

Module 2: **(04hrs.)**

Basics of Kernel, Kernel Functions. Who, why & what is root. What is Shell & Shell Variables, Basic commands i.e. mkdir, touch, ls, pwd, cd, chmod, df, du, dd, adduser, sort, passwd, rm/rmdir, date, tar, gzip , top. Editors,Vi Editor.

Module 3: **(04hrs.)**

Understanding Files and Directories in Linux, File Structure and hierarchy, Different File Systems & File Permissions. Network-Based File Systems, Virtual File systems, UFS File System.

Module 4: **(04hrs.)**

Perform Unix Utilities -vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities.

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Module 5: **(06hrs.)**

System Security, System Access Control, Shells Controlling File Access Restrictions, File Access Command. Access Control List (ACLs), Setting ACL Entries, Modifying ACL entries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super User Access, Restricting Root Access, Monitoring super user Access, TCP Wrappers. Case Study: -Installation of SAMBA, APACHE, TOMCAT, Implementation of DNS services, Firewall, Proxy server

Course Outcomes:

1. Understand Linux/Unix Operating System concepts.
2. Use System calls and memory management.
3. Use LINUX commands and editors.
4. Carry out LINUX File management and shell programming in LINUX
5. Describe and use the fundamental LINUX system tools and utilities.

List of Text / Reference Books:

1. Gopalan, Shivaselvan, ”Beginners Guide to Unix ” PHI Learning.
2. Sumitab Das, ”Unix Concept & Application”, TMH.
3. Venkatesh Murthy, “Introduction to Unix &Shell”, Pearson Edu.
4. Kochan S & Wood P, UNIX Shell Programming, Pearson Education, 2008.

List of Experiments:

1. Introduction of Linux and basic features of Linux.
2. Installation Process of Linux Operating System.
3. Linux System Architecture.
4. Perform Unix Basic Commands – Date, Cal, man, echo, printf, passwd, uname, who, date, pwd.
5. Working with Directories and files.
6. Working with wildcards.
7. Perform Unix Utilities -vi editor, file handling utilities, security by file permissions.
8. Networking commands, unlink, du, df, mount, umount, find, unmask, ps, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities.
9. Perform File Management: File Structures, System Calls for File Management – create, open, close, read, write, lseek, link etc.
10. Perform Unix/Linux Admin/User Administration Task like manage user and groups.

IPS Academy, Institute of Engineering & Science

(A UGC Autonomous Institute, Affiliated to RGPV, Bhopal)

Scheme Based on AICTE Flexible Curriculum

Department of Computer Science & Engineering

Bachelor of Technology (B.Tech.)

[Computer Science & Engineering (IOT and Cyber Security Including Block Chain Technology)] (CSITCS)

V-Semester

PROJ-CB-01	Mini Project	0L:0T:4P (4hrs.)	2 Credits

Prerequisite: A sound knowledge in subjects of respective stream.

Course Objective: The main objective of Mini Project is to offer a platform for students to apply theoretical concepts and programming knowledge in a practical setting, solving real time problems or situations fostering creativity, problem solving abilities and technical proficiencies.

Course Outcome:

1. Understand, plan, and execute a Mini Project with team.
2. Acquire knowledge within the chosen area of technology for project development.
3. Identify, discuss, and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
4. Communicate and report effectively project related activities and findings.
5. Formulate and propose a plan for creating a solution for the problems identified.
6. Report and present the finding of the study conducted in the preferred domain.

Guidelines:

The mini project is desirable to be done in a group of minimum 01 or maximum 3 students. Each group has to prepare a title related to any engineering discipline, and the title must emulate any real-world problem.