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)

IV Semester

Sr. No.	Course Type	Course Code	Course Title	Scheme			Credits
				L	T	P	
1	BSC	MA03	Probability & Statistics	2	1	–	3
2	PCC	CB05	Computer Network	2	1	–	3
3	PCC	CB06	Sensors and Actuators	2	1	–	3
4	PCC	CB07	Data Base Management System	3	1	–	4
5	HSMC	HS04	Entrepreneurship and Principles of Management	1	–	–	1
6	IFC	AL01	Interdisciplinary Foundation Course-I	2	–	–	2
7	LC	CB05(P)	Computer Network Lab	–	–	2	1
8	LC	CB06(P)	Sensors and Actuators Lab	–	–	4	2
9	LC	CB07(P)	Data Base Management System Lab	–	–	2	1
10	SBC	CB01(P)	IoT Workshop	–	–	4	2
11	LLC02	LLC	Liberal Learning Course –II (NCC/NSO/NCA)	–	–	2	1
12	MLC	MLC02	Constitution of India	1	–	–	Audit*
Total Academic Engagement and Credits				**13**	**4**	**14**	**23**
				31			

Note:

- **IoT Workshop –SBC-IO01**
  - Platform Tool- Raspberry Pi/ Arduino

- **Interdisciplinary Foundation Course-I (IFC –AL 01)**
  (Offered by CSE-AIML Branch)
  - Foundation of AIML

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IV Semester

CB05	Computer Network	2L:1T:0P(3hrs.)	3credits

Prerequisite: - Data Communication

Course Objective: This course provides foundation to understand computer networks using layered architectures.

Course Contents:

Module 1: **(08 Hrs.)**
Introduction to computer networks: Network – Component and Categories – Topologies Reference Models: ISO/OSI Model and TCP/IP Protocol suite. Principals of physical layer: Transmission Media, Bandwidth, Multiplexing, Switching, X.25, ISDN.

Module 2: **(08 Hrs.)**
Data Link Layer: Need, Services Provided, Framing, Flow Control, Error control. Data Link Layer Protocol: Elementary & Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Hybrid ARQ. Protocol verification: Finite State Machine Models & Petrinet models. HDLC, ARP/RARP, error detection & correction technique.

Module 3: **(08 Hrs.)**
MAC Sublayer: MAC Addressing, Binary Exponential Back-off (BEB) Algorithm, Distributed Random Access Schemes/Contention Schemes: for Data Services (ALOHA and Slotted- ALOHA), for Local-Area Networks (CSMA, CSMA/CD, CSMA/CA), Collision Free Protocols: Basic Bit Map, Binary Count Down, Adaptive Tree Walk, Performance Measuring Metrics. IEEE Standards 802 series & their variant.

Module 4: **(08 Hrs.)**
Network Layer: Need, Services Provided, Design issues, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing. IP Addresses, Header format, Packet forwarding, Fragmentation and reassembly, ICMP, Comparative study of IPv4 & IPv6.

Module 5: **(08 Hrs.)**
Transport Layer: Design Issues, UDP: Header Format, Per-Segment Checksum, Carrying Unicast/Multicast Real-Time Traffic, TCP: Connection Management, Reliability of Data Transfers, TCP Flow Control, TCP Congestion Control, TCP Header Format, TCP Timer Management. Application Layer: WWW and HTTP, FTP, SSH, Email (SMTP, MIME, IMAP), DNS, Network Management (SNMP).

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Department of Computer Science & Engineering

Bachelor of Technology (B.Tech.)

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

IV Semester

Course Outcomes:

1. Describe basics of computer network, network architecture, TCP/IP protocol suite, OSI reference models & fundamentals of physical layer.
2. Classify data link protocol like flow control, error control, bit oriented protocol.
3. Paraphrase multi-channel access protocol, IEEE 802 standards & use Ethernet standards.
4. Explain routing & congestion algorithm. State IP protocol, addressing & subnet.
5. Distinguish various transport & application layer protocols

List of Text Books/ Reference Books:

1. Andrew S. Tanenbaum, David J. Wetherall, "Computer Networks" Pearson New International Edition, 5th Edition, 2013.
2. Douglas E Comer, "Internetworking with Tcp/Ip Principles, Protocols, And Architecture Volume I" 6th Edition, Prentice Hall of India.
3. Dimitri Bertsekas, Robert Gallager, "Data Networks", PHI Publication, Second Edition.
4. Kaveh Pahlavan, Prashant Krishnamurthy, "Networking Fundamentals", Wiley Publication First Edition, 2009.
5. Uyless Black, "Computer Networks", PHI Publication, Second Edition.
6. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", McGrawHill.2011.
7. Behrouz A. Forouzan, "Data Communication and Networking", McGraw Hill, 5th Edition, 2013.
8. William Stallings, "Data and Computer Communication" 8th Edition, 2007.
9. W. Richard Stevens. "TCP/IP Illustrated, Volume 1", Addison-Wesley, United States of America.

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IV Semester

CB06	Sensors and Actuators	2L:1T:0P(3hrs.)	3credits

Prerequisite: Basic introduction to IoT

Course Objective: The objective of this course is to recognize the importance of sensors and actuators, and gain knowledge of the physical principles behind each sensor.

Course Contents:

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

Historical development of sensors, classification of sensors, Sensor as a passive or active element, sensor as a part of a measurement system, sensor properties, Actuators in IoT.

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

Physical Principles Of Sensing: - Electric Charges, Fields, and Potentials - Capacitance - Magnetism - Induction - Resistance - Piezoelectric Effect -Pyroelectric Effect - Hall Effect - Seebeck and Peltier Effects – Sound Waves - Temperature and Thermal Properties - Heat Transfer

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

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 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 - Acoustic Temperature Sensor - Piezoelectric Temperature Sensors.

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

Pressure Sensors: Concepts of Pressure - Units of Pressure - Mercury Pressure Sensor -Bellows, Membranes, and Thin Plates - Piezoresistive Sensors - Capacitive Sensors - VRP 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- Cantilever MEMS sensors – Dust and smoke detectors

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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)

IV Semester

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

Light Detectors: Introduction -Photodiodes - Phototransistor –Photoresistors - Cooled Detectors - Imaging sensors -UV detectors -Thermal Radiation Detectors 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. Describe the importance of sensors
2. Outline the physical principles behind each sensor.
3. Bring out the different types of temperature, acoustic, humidity & moisture sensors.
4. Identify different pressure and flow detectors for sensing
5. Introduce the concept of actuators and their features.

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 tranducers" Newnes publisher, Third Edition, 2001

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

IV Semester

CB07	Data Base Management System	3L:1T:0P (4hrs.)	4 credits

Prerequisite: Nil

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 FD dependency preservation, lossless join, BCNF, Multi-valued dependency, 4NF, Join dependency and 5NF.

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.

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)

IV Semester

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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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)

IV Semester

IFC-AL01	Foundation of AIML	2L:0T:0P(2hrs.)	2 credits

Prerequisite:

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.

IPS Academy, Institute of Engineering & Science

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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)

IV 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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Department of Computer Science & Engineering

Bachelor of Technology (B.Tech.)

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

IV Semester

CB05(P)	Computer Network Lab	0L:0T:2P(2hrs.)	1credit

Prerequisite: Data Communication**.**

Course Objective: The course is designed to provide Basic knowledge of Computer Network. Computer Networking is intended for Network engineers, Network designers and Network administrators who wish to aim for telecommunication domain. Learning Outcomes - Understanding of computer network, Network designing and troubleshooting.

Course Contents:

Module 1: **(04hrs.)**
Introduction to computer networks: Networking Devices, Network – Component and Categories, Local area networks and Wide area networks. Color coding standard of CAT 5,6,7 and crimping of cable in RJ-45, Principals of physical layer: Transmission Media, Bandwidth.

Module 2: **(04hrs.)**
Introduction to packet tracer simulator, Network topologies, Data Link Layer Protocol: Elementary; Sliding Window protocol: 1-bit, Go-Back-N, Selective Repeat, Error control, framing. ARP.

Module 3: **(04hrs.)**
Network Layer: Routing algorithms: Dijkstra algorithm, Bellman-ford algorithm, IP Addresses classful; classless addressing, IP routing, Subnetting and supernetting, ICMP.

Module 4: **(04hrs.)**
Transport Layer: TCP service protocols, UDP: Header Format, Per-Segment Checksum, Socket programming.

Module 5: **(06hrs.)**
Introduction to the various internetworking devices and their basic configuration, Study of various application layer protocols.

IPS Academy, Institute of Engineering & Science

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Department of Computer Science & Engineering

Bachelor of Technology (B.Tech.)

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

IV Semester

Course Outcome:

1. Demonstrate LAN configuration and discuss various types of transmission media and network equipments.
2. Implement various functionalities of data link layer and build network topology using packet tracer.
3. Analyze the requirements for a given organizational requirement and select the most appropriate networking architecture and technologies.
4. Implement socket programming and simulate TCP using wireshark.
5. Distinguish various internetworking devices and study of application layer protocols.

List of Text/Reference Books:

1. Andrew S. Tanenbaum, David J. Wetherall, "Computer Networks" Pearson New International Edition, 5thEdition, 2013.
2. Douglas E Comer, "Internetworking with Tcp/Ip Principles, Protocols, And Architecture Volume I" 6th Edition, Prentice Hall of India.
3. Dimitri Bertsekas, Robert Gallager, "Data Networks", PHI Publication, Second Edition.
4. Kaveh Pahlavan, Prashant Krishnamurthy, "Networking Fundamentals", Wiley Publication. First Edition, 2009
5. Uyless Black, "Computer Networks", PHI Publication, Second Edition.
6. Ying-DarL in, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open-Source Approach", McGrawHill.2011.
7. Behrouz A. Forouzan, "Data Communication and Networking", McGraw Hill, 5th Edition, 2013.
8. William Stallings, "Data and Computer Communication" 8thEdition, 2007.
9. W. Richard Stevens. "TCP/IP Illustrated, Volume 1", Addison-Wesley, United States of America.

List of Experiments:

1. Study of Different Type of LAN & Network Equipment.
2. Study and Verification of standard Network topologies i.e., Star, Bus, Ring etc.
3. LAN installations and Configurations.
4. Write a program to implement various types of error correcting techniques.
5. Write a program to implement various types of framing methods.
6. Study of Tool Command Language (TCL).
7. Study and Installation of Standard Network Simulator: N. S-2, N. S-3, OpNet, Qual Net etc.
8. Study & Installation of ONE (Opportunistic Network Environment) Simulator for High Mobility Networks.
9. Configure 802.11WLAN.
10. Implement & simulate various types of routing algorithm.
11. Study & Simulation of MAC Protocols like Aloha, CSMA, CSMA/CD and CSMA/CA using standard Network Simulators.
12. Study of Application layer protocols-DNS, HTTP, HTTPS, FTPS and Telnet.

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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)

IV Semester

CB06(P)	Sensors and Actuators Lab	0L:0T:4P(4hrs.)	2credits

Prerequisite: Basic introduction to IoT

Course Objective:
The objective of this course is to recognize the importance of sensors and actuators, and gain knowledge of the physical principles behind each sensor.

Course Contents:

Module 1: **(06hrs.)**
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: **(06hrs.)**
RFID cards, Tags & Readers: working principle, frequency ranges: Low Frequency, High Frequency, and Ultra-High Frequency, Types: Active RFID, Passive RFID

Module 5: **(04hrs.)**
Distance Sensor, Light/Color Sensor, Motor Driver, BO motor, sound sensor

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Department of Computer Science & Engineering

Bachelor of Technology (B.Tech.)

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

IV 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" Newnes 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

IPS Academy, Institute of Engineering & Science

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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)

IV Semester

CB07(P)	Data Base Management System Lab	0L:0T:2P(2 hrs.)	1credit

Prerequisite: Nil

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

Course Contents:

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

DBMS Concepts and architecture Introduction, Advantages of database systems, Data models, Schemas and instances, 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: **(04 Hrs.)**

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.

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

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.

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

Transaction Processing Concept: Transaction system, Testing of Serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery.

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

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

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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)

IV Semester

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.

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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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)

IV Semester

CB01(P)	IoT Workshop	0L:0T:4P(4hrs.)	2credits

Prerequisite: Fundamentals of Electronics and Electrical Engineering

Course Objective: The main objective of this course is:

1. To understand the basics of various active & passive electronic components
2. To understand the operation of various instruments like CRO, Function generator & Multi meter.
3. To understand the basics of bread board & PCB design.

Course Contents:

Module 1: **(04hrs.)**
Study of Electronic components, all types of discrete active and passive devices, display devices, integrated components/circuits with their packing's etc.

Module 2: **(06hrs.)**
Electromechanical components; switches, sockets, connectors (BNC, TNC and N types of connectors) etc., Electromagnetic components; coils-different types of magnetic and ferrite cored, potted components, relays, step up and step-down transformers etc.

Module 3: **(06hrs.)**
Operation of Function generator, multi meter and DC power supply.

Module 4: **(04hrs.)**
Operation of CRO & Measurement of voltage, frequency, and Phase Angle.

Module 5: **(04hrs.)**
Soldering and desoldering exercise using discrete components and ICs for a specific circuit requirement

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)

IV Semester

Course Outcome:

1. To recognize the basic electronic components and devices.
2. To operate the basic Electronic Instruments.
3. To make small circuits on bread boards and check their continuity.
4. To design PCBs for small circuits.

List of Text/Reference Books:

1. Zbar, P.B. Basic Electronics. A Text-Lab Manual, 7th Edition, TMH, 1995.
2. James M. Kirkpatrick, Electronic drafting and Printed Circuits board design, Galgotia Publisher, 1988.
3. Paul B. Zbar, Industrial Electronics, A Text – Lab Manual, 3rd Edition, TMH, 1983.
4. Harper, Handbook of Electronic Component, 2nd Edition, 1997.
5. Goyal & Khetan, A Monograph of Electronic Design, 2nd Edition, 1983, Khanna Pub.

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)

IV Semester

MLC(02)	**Constitution of India**	**1L:0T:0P(1hrs.)**	**0 credit**

Prerequisite: Nil

Course Objective: The objective of this course is to familiarize the students with the feature of the Indian constitution, laws, democracy etc.

Course Contents:

Module 1: **(08hrs.)**
Historical background: Formation and working of constituent assembly, formation and working of drafting committee, commencement of Indian constitution, Dr. Ambedkar's ideas of reservation in constitution.

Module 2: **(08hrs.)**
Important features of the constitution: Preamble, fundamental rights, directive principles of state policy, fundamental duties, center state relation.

Module 3: **(08hrs.)**
Parliamentary democracy: Loksabha, Rajyasabha, central exclusive president, prime minister, and central ministry, Vidhansabha, Vidhanparishad and state executive (Governor, Chief Minister, Minister of state).

Module 4: **(08hrs.)**
Special provisions in Indian constitution: finance commission contingency fund, consolidated fund, public service commissions, election commission, safeguards for SC, ST and backward classes, provisions for emergency and constitutional amendments, Indian judiciary supreme court and high court.

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.)

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IV Semester

Course Outcome:

1. Commencement of Indian Constitution
2. Features of Indian constitution
3. Working and functions of Parliamentary house
4. Provisions in Indian Constitution

List of Text/Reference Books:

1. Austin, G. (1999), The Indian Constitution, Oxford, Oxford University Press
2. Pylee, M. V. (2016), India's Constitution (16 Edition), New, Delhi, S. Chand Publication
3. Kumar, R. (2011), Ambedkar and Constitution (1st Edition), New Delhi, Commonwealth Publication Pvt. Ltd.