YEAR-WISE AND SEMESTER-WISE DISTRIBUTION OF SUBJECTS
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)
FIFTH SEMESTER
ACADEMIC YEAR 2024-25 OF 2022-25 BATCH (CBCS)

Sl. No	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs.)	Marks			Credits
						Internal	External	Total	
	THEORY								
1	II	CSIT24501A	Infrastructure Security (DSE-1)	4	3	40	60	100	4
		CSIT24501B	Computer Forensics (DSE-1)						
2	II	CSIT18503	Data Base Management Systems (Core-15)	4	3	40	60	100	4
3	II	CSIT21504	Linux Administration (Core-14)	4	3	40	60	100	4
4	II	CSIT21505	Software Engineering (Core-17)	4	3	40	60	100	4
5	II	CSIT24502	Machine Learning (Core-16)	4	3	40	60	100	4
		PRACTICALS							
6	II	CSIT18506	Data Base Management Systems- Lab (Core-15)	2	3	40	60	100	1
7	II	CSIT24507	Web Programming - Lab (SEC-4)	3	3	40	60	100	2
8	II	CSIT21509	Linux Administration - Lab (Core-14)	2	3	40	60	100	1
9	II	CSIT24510	Machine Learning _Lab (Core-16)	2	3	40	60	100	1
10	II	CSIT18508	Internship	-	-	40	-	40	3
Total				**29**		400	540	940	**29**

***Discipline-Specific Elective (DSE) *Skill Enhancement Course (SEC)**

INFRASTRUCTURE SECURITY
(Discipline Specific Elective -1)
(NEW SYLLABUS)

Credits: 4 **Semester: V**
Course Code: CSIT24501A **No. of Lecture hrs: 60**

Course Objectives

- To understand underlying principles of infrastructure security
- To explore software vulnerabilities, attacks, and protection mechanism
- To learn security aspects of wireless network infrastructure and protocols
- To investigate web server vulnerabilities and their countermeasures
- To develop policies for security management and mitigate security-related risks in the organization
- To Learn the different attacks on Open Web Applications and Web services.

Course Outcomes:

CO1: Understand the concept of attacks and Security protection mechanisms
CO2: Analyze and evaluate attacks on databases and cloud
CO3: Explain the need for OS and Multilevel security
CO4: Explain various risk assessment and IT security
CO5: Evaluate different attacks on Open Web Applications

UNIT-I	**12 Hrs**
1. Computer Security	
2. Concepts, Threats, Attacks and Assets	2
3. Security Functional Requirements, Security Design principles	2
4. Attack Surfaces and Attack Trees, Computer Security strategies	2
5. Access control Principles, Subjects, Objects and Access Rights	2
6. Discretionary, role based and Attribute based control	4
UNIT-II	**12Hrs**
1. Database and Cloud Security	
2. Need for database security, DBMS and relational databases	2
3. SQL injection attacks, Database Access Control, Inference, Encryption	4
4. Cloud Computing, Risks and Countermeasures, Data	3

protection in cloud	
5. Cloud Security as a Service	3
UNIT-III	**12Hrs**
1. **Operating System Security**	3
2. Introduction, System security planning, OS Hardening	3
3. Application Security, Security Maintenance	3
4. Linux, Windows and Virtualization Security	3
UNIT-IV	**12Hrs**
1. **IT Security Management and Risk Assessment**	
2. IT Security Management, Organizational Context and Security Policy	3
3. Security Risk Assessment, Security Risk Analysis	3
4. IT Security Management Implementation, Safeguards, Security Plan	3
5. Implementation of controls and Monitoring Risks	3
UNIT-V	**12Hrs**
1. **Web Security**	
2. Browser attacks	3
3. Web Attacks Targeting users	3
4. Obtaining User or Website Data	3
5. Email attacks	3

ESSENTIAL READING

1. William Stallings and Lawrie Brown. 2015. **Computer Security Principles and Practice**. 3rd Edition. Pearson Education (UNIT: II, III, IV, V)
2. PFleeger, Charles P, Pfleeger, Shari Lawrence, Margulies Jonathan. Security in Computing. 5th Edition. Prentice Hall (UNIT: I)

COMPUTER FORENSICS
(Discipline Specific Elective -1)
(NEW SYLLABUS)

Credits: 4 **Semester: V**
Course Code: CSIT24501B **No. of Lecture hrs: 60**

Course Objectives

- Understand the role of Computer Forensics in digital evidence plays in criminal and civil investigations and incident response.

Course Outcomes:

CO1: **To Understand** Computer Forensics in detail.
CO2: **Identify** the types of Evidence and Methods of collecting evidence.
CO3: **To Explain** Computer Forensics analysis and validation
CO4: To **Analyze** Current Computer Forensic tools
CO5: To **Understand** acquisition procedures for cell phones and mobile devices

UNIT-I	**12 Hrs**
Computer Forensics Fundamentals	
1. What is Computer Forensics Use of Computer Forensics in	2
2. Law Enforcement.	2
3. Computer Forensics Services.	2
4. Forensics Methodology	2
5. Types of Military Computer Forensic Technology	2
6. Types of Computer Forensics Technology	2
UNIT-II	**12Hrs**
Evidence Collection and Data Seizure	
1. Why Collect Evidence, Types of Evidence, The Rules of Evidence.	4
2. Methods of Collection, Controlling, Contamination	4
3. Computer Evidence Processing Step	4
UNIT-III	**12Hrs**
Computer Forensics analysis and validation	
1. Determining what data to collect and analyze, validating forensic data	2
2. Addressing data-hiding techniques, performing remote acquisitions	1
3. Processing Crime and Incident Scenes:	2
4. Identifying digital evidence, collecting evidence in private-sector incident scenes.	2
5. Processing law enforcement crime scenes, preparing for a search	2

6. Securing a computer incident or crime scene	2
7. Seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case	1
	12Hrs

UNIT-IV

Current Computer Forensic tools

1. Evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools validating and testing forensics software	4
2. E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in email, investigating email crimes and violations,	4
3. Understanding email servers, using specialized email forensic tools.	4

UNIT-V **12Hrs**

1. Cell phone and mobile device forensics: Understanding mobile device forensics,	2
2. Understanding acquisition procedures for cell phones and mobile devices	1
3. Working with Windows and DOS Systems: Understanding file systems, exploring Microsoft File Structures, Examining NTFS disks,	6
4. Understanding whole disk encryption, windows registry	3

ESSENTIAL READING

1. John R. Vacca, Computer Forensics, Computer Crime Investigation, Firewall Media, New Delhi.
2. Nelson, Phillips Enfinger, Steuart, Computer Forensics and Investigations CENGAGE Learning

REFERENCE READING

1. Real Digital Forensics by Keith J. Jones, Richard Bejtiich, Curtis W. Rose, Addison Wesley Pearson Education 2
2. Forensic Compiling, A Practitioner's Guide by Tony Sammes and Brian Jenkinson, Springer International edition.

DATABASE MANAGEMENT SYSTEMS

Credits: 4 **Semester: V**
Course Code : CSIT18503 **No of Lecture Hours: 60**

Objectives:

- To design a database and enforce Integrity Constraints to keep database consistent.
- To normalize tables to eliminate redundancies.
- To query relational data using Structured Query Language.
- To understand storage strategies for easy retrieval of data through index.
- To understand PL/SQL and transaction management.

Course Outcomes:

CO1: **Represent** logical database using Entity Relationship and Enhanced ER model.
CO2: **Formulate** database using relational algebra and organize relation using normalization.
CO3: **Design** SQL queries and implements PL/SQL.
CO4: **Classify** the storage and file structure, storage access, indexing and hashing techniques of the database.
CO5: **Explain** the concept of Transactions, recovery system and concurrency control.

UNIT-I	**12Hrs**
1. Introduction, data base applications and purpose	2
2. View of data, data base languages-DDL, DML	2
3. Data base architecture, users and administrators	2
4. Design process overview, Entity relational ship model, Constraints	2
5. ER diagrams, design issues, weak entity sets	2
6. Extended ER features	2

UNIT-II	**12Hrs**
1. Structure of Relational model, Reduction to schema	1
2. Relational algebra- union, project, select and other operations	3
3. SQL- data definition, structure, set operations, Aggregate functions	2
4. Modification of data base, Nested sub queries, views, Joins and Null values	3
5. Introduction to Normalization, 1NF, 2NF and 3NF, BCNF	3

UNIT-III	**12Hrs**
1. Introduction, Programming, Functions and Procedures	2
2. Triggers, Cursors-implicit, explicit, cursor for loops	3
3. Error handling in PL/SQL, Authorization, granting, revoking privileges	3
4. Roles, Authorization on views, functions and procedures	2
5. Application security	2

UNIT-IV	**12Hrs**
1. Overview of physical storage media	1
2. Magnetic disks- physical characteristics and performance measures	1
3. Buffer manager, replacement policies, File organization	3
4. Organization of records in files	2
5. Ordered indices, Index sequential-B+ trees	2
6. Static hash function, Dynamic hash function, comparison	3

UNIT-V	**12Hrs**
1. Transactions- concepts, states	1
2. Implementation of Atomicity and durability, Concurrent executions	1
3. Serializability, Recoverability, Testing for Serializability	1
4. Concurrency control, lock based protocols, locks and granting locks	1
5. Two Phase locking and dead lock handling	2
6. Recovery system, failure	1
7. Storage structure- storage types, data access	1
8. Recovery and Atomicity, log-based recovery, Check points	2
9. Distributed Databases- Homogenous &Heterogeneous, Distributed data storage	2

ESSENTIAL READING

1. Korth Henry, F. SilberSchatz Avi. And Sudarshan, S. 2008. **Database System Concepts.** 5th Edition. New Delhi: Tata McGraw-Hill.
2. Bayross Ivan. 2010. **SQL, PL/SQL- The Programming Language for Oracle**. 4th Edition. New Delhi: BPB Publications.

SUGGESTED READING

1. McFadden Fred, R. Hoffer Jeffery, A and Prescott Mary, B. 2007. **Modern Database Management**. 8th Edition. New Delhi: Pearson.
2. Elmasri Ramez, Navathe and Shamkant, B. 2008. **Fundamentals of Database Systems**. 5th Edition. New Delhi: Pearson Education.

LINUX ADMINISTRATION

Credits : 4 **Semester: V**
Course Code : CSIT21504 **No. of Lecture Hours: 60**

Objective: To learn the basics of Unix/Linux and different Services of Linux

Course Outcomes:
CO1: **Describe** Installation of Linux and User, Group Administration, ACL
CO2: Explain the configuration NFS, FTP and Send mail server
CO3: Explain configuration DHCP and SElinux
CO4: Explain configuration SAMBA and DNS server
CO5: Explain the configuration Apache server, disk quotas

UNIT-I	**12Hrs**
1. History of Linux & GNU- LINUX, Features and Overview of Linux.	1
2. Difference between Fedora/RHEL,	1
3. Compressing & Archiving files (bzip2, b2cat, bunzip 2, tar).	1
4. Permissions, setuid, setgid and sticky bit. Access control lists (getfacl, setfacl)	2
5. Links, Hard Links, Symbolic link, removing a link.	1
6. User Administration & group Administration.	2
7. Backing up file, choosing a backup medium, backup utilities, Performing simple backup.	1
8. The init Demon, Start & Stop System & server, Run levels.	1
9. Scheduling task using at &crond.	1
10. Working with nmtui command.	1

UNIT-II	**12Hrs**
1. Introduction to FTP,security,FTP Connections,FTP Clients.	1
2. Running FTP and SFTP clients Basic commands:hostname, get, put, open, prompt, mget.	1
3. Configuring a vsftpd server description of directives logging in, anonymous users, uploading & downloading files messages.	1
4. Introduction to sendmail, outbound-Email, Inbound email alternatives to send mail	1
5. Setting up send mail server Configuring sendmail on a client, mail logs	1
6. Additional Email tools, Squirrelmail, difference b/w SMPT, POP3, IMAP	1
7. Software Package Administration, Installation/uninstallation/ querying And updating software packages	3
8. Introduction to NFS, NFS Client/Server setup, Running an NFS Client	1
9. Mounting a remote directory configuring NFS using system-config-nfs	2

UNIT-III	**12Hrs**
1. Securing a system, SELinux config: The SELinux configuration file	2
2. Getenforce, Setenforce and setstatuscommands	2
3. Introduction to DHCP, working of DHCP, DHCP client	2
4. dhcpd:the DHCP Daemon , Static IP address,	2
5. Virtualization with Xen	2
6. RAID levels, LVM	1
7. Intro to Web Based administration	1

UNIT-IV	**12Hrs**
1. Introduction to SAMBA, Samba utilities & daemons, Samba Users	2
2. user Maps, Passwords, running Samba Clients	2
3. Working with Shares from Linux, Working with shares from windows	2
4. Setting up Samba Server, Configuring Samba Server using System-config-Samba,	2
5. Samba config-manually configuring a Samba server parameters in smbd.conf.file	1
6. Intro to DNS nodes, domains and subdomains, Zones	1
7. Queries, servers, Resource Records DNS working	1
8. Setting up a domain using System-config-bind, Setting up a Domain server	
9. Adding resource records	1

UNIT-V	**12Hrs**
1. Introduction to Firewall, Firewall configuration window	2
2. Building a firewall using system-config-firewall. Introduction to Iptables, Filtering a packet in kernel,Anotomy of iptables command.	3
3. Apache server introduction, Running apache web server modifyinghttpd.conf configuration file testing apache	3
4. Configuring directives, listen, server Admin, DocumentRoot, Servername , DirectoryIndex,Contexts& Containers	2
5. Disk Quota, Enabling Quota's on partition, Creating Quota's for user.	2

ESSENTIAL READING

1. Christopher Negus, Eric Foster-Johnson. 2009. **Fedora10 and Red Hat Enterprise Linux Bible.** New Delhi: Wiley.
2. Sobell Mark, G. 2014. **A Practical Guide to Fedora and Red Hat Enterprise Linux. 7**th Edition. New Delhi: Prentice Hall of India.
3. Vugt Sander van. 2013. **Red Hat Enterprise Linux 6 Administration: Real World Skills for Red Hat Administrators.** USA: SYBEX Inc.
4. Fox Tammy. 2007. **Red Hat Enterprise Linux 5 Administration UNLEASHED**. SAMS Publishers

SOFTWARE ENGINEERING
(NEW SYLLABUS)

Credits: 4 **Semester: V**
Course code: CSIT21505 **No. of Lecture Hours: 60**
Objectives:

- To enable students, learn software engineering principles
- To learn the theoretical foundation from the view of object-oriented concept.

Course Outcomes:
CO1: **Design** software through various process models.
CO2: **Analyze** Object Oriented concepts and various Models.
CO3: **Choose** different designs and architectures.
CO4: **Explain** components, golden rules and design evaluation.
CO5: **Select** testing techniques and determine its quality.

UNIT - I	**12Hrs**
1. The evolving role of software, software, changing nature of software	2
2. Legacy Software, Software Myths	2
3. Software engineering-layered technology, Process Framework	2
4. CMMI, Process patterns, Personal and Team Process models	1
5. Process Models: waterfall, incremental, evolutionary process models	2
6. Agile process models	3

UNIT- II	**12Hrs**
1. Requirements Engineering tasks, initiating requirements engineering process	2
2. Eliciting requirements	1
3. Developing Use Cases, Building analysis model	2
4. Negotiating and validating requirements	1
5. Requirements analysis, analysis modeling approaches, Data modeling Concepts	2
6. Object oriented analysis, Scenario based modeling, Flow oriented modeling	2
7. Class based modeling, creating behavioral model, Case Study	2

UNIT- III	**12Hrs**
1. Design Process and Quality	2
2. Design concepts and Design model	2
3. Pattern Based software design	2
4. Software architecture, Data design Architectural styles and Patterns	2
5. Architectural design, Assessing alternative architectural design	2
6. Managing Data flow into Software architecture	2

UNIT- IV	**12Hrs**
1. Introduction to Component, Designing class based components	2
2. Conducting component level design, Object constraint language	2
3. Design conventional components	2
4. Golden rules, User Interface Analysis and Design	2
5. Interface analysis, Interface design steps	2
6. Design Evaluation	2

UNIT- V	**12Hrs**
1. A Single approach to Software testing	1
2. Strategic issues, Test strategies for Conventional Software	1
3. Validation testing, System Testing	1
4. Testing fundamentals, Black box and White Box Testing	2
5. Basis Path Testing, Control Structure Testing	2
6. Software quality	1
7. Metrics for analysis model	2
8. Metrics for design model, Metrics for source code	1
9. Metrics for testing, Metrics for maintenance.	1

ESSENTIAL READING

1. Pressman, Rogers S. 2015. **Software Engineering, A practitioner's Approach.** 6th Edition**.** McGraw Hill Education

SUGGESTED READING

1. Deepak Jain. 2009. **Software Engineering.** New Delhi: Oxford University Press.
2. Rajib Mall. 2009. **Fundamentals of Software Engineering.** 3rd Edition. New Delhi: PHI.
3. Sommerville. 2007. **Software Engineering.** 7thEdition.New Delhi: Pearson Education.

MACHINE LEARNING
(NEW SYLLABUS)

Credits: 4 **Semester: V**
Course Code: CSIT24502 **No. of Lecture hrs: 75**

Course Objectives

- To understand the concepts of machine learning
- To understand supervised and unsupervised learning and their applications
- To learn aspects of computational learning theory

Course Outcomes:

CO1: Have a good understanding of the fundamental issues and challenges of machine learning and basics of Python for machine learning
CO2: Classify the supervised learning algorithms and apply to the given data set.
CO3: Identify the underlying relationships within and across unsupervised Machine Learning algorithms
CO4: Evaluate and interpret the results of Neural Networks
CO5: Design and implement advanced machine learning algorithms

UNIT-I **15 Hrs**

Introduction to Machine Learning

1.	Overview of Machine Learning -Definition, scope, and applications	2
2.	Types of learning: supervised, unsupervised, reinforcement.	3
3.	Basic concepts and Python basics for ML Understanding datasets, features and labels	3
4.	Exploratory data analysis, data visualizations	3
5.	Libraries: NumPy, Pandas, Matplotlib.	4

UNIT-II **15Hrs**

Supervised Learning

1.	Linear Regression -Basic and Mathematical Representation	4
2.	Introduction to regression Linear and multiple regression Classification Algorithms	3
3.	Logistic Regression, K-NN, Decision Trees, SVM.	4
4.	Evaluation metrics: accuracy, precision, recall.	4

UNIT-III **15Hrs**

Unsupervised Learning

1. Clustering - K-Means, Hierarchical 5
2. Dimensionality Reduction – PCA 5
3. Association Rule Learning - Apriori algorithm. 5

15Hrs

UNIT-IV

Introduction to Neural Networks

1. Basics of Neural Networks - Neurons, layers, activation functions. 5
2. Feedforward and backpropagation. 5
3. Types of Neural Networks - MLPs, CNNs, RNNs. 5

UNIT-V **15Hrs**

Advanced Topics in Machine Learning

1. Natural Language Processing (NLP) Basics and applications in text processing. 4
2. Transfer Learning - Understanding transfer learning. Application of pre-trained models. 4
3. Artificial Intelligence Integration Exploring intersections between AI and ML. Applications and synergies. 3
4. Reinforcement Learning Fundamentals Basics, algorithms, and key concepts. 4

ESSENTIAL READING

1. An Introduction to Machine Learning & quot; by Alpaydin, Ethem (Edition: 4th, Year: 2020)
2. Python Machine Learning & quot; by Raschka, Sebastian (Edition: 3rd, Year: 2019)
3. Hands-On Machine Learning with Scikit-Learn, Keras, and Tensor Flow & quot; by Géron,
4. Aurélien (Edition: 2nd, Year: 2019)

SUGGESTED READING:

1. Machine Learning Yearning & quot; by Ng, Andrew (Edition: 1st, Year: 2018)
2. Pattern Recognition and Machine Learning & quot; by Bishop, Christopher M. (Edition: 1st, Year: 2006) - Note: This one is slightly older but highly regarded in the field.

DATABASE MANAGEMENT SYSTEMS LAB

Credits : 1 **Semester: V**
Course Code: CSIT18506 **No. of Practical Hours: 30**

Objectives:

- To present the concepts and techniques relating to query processing by SQL engines.
- To present SQL and procedural interfaces to SQL comprehensively.

Outcome: Students will be able to use commercial relational database system (Oracle) by writing Queries using SQL and implement PL/SQL.

No. of Hours	TOPICS
1	Data definition language commands
2	Data manipulation language commands
3	Simple to complex condition query creation using SQL Plus
4	Queries involving set operators, aggregate functions
5-6	Queries involving scalar function: String, Numeric, Conversion and Date
7	Queries involving group-by and having clause, order by clause
8	Queries involving sub-queries and views
9	Queries involving types of joins-inner, outer joins
10	Queries involving forms and reports
11	Queries involving Data control and transactional commands
12	Creating simple PL/SQL programs involving loop and decision
13	Creating PLSQL cursors, triggers
14	Creating PL/SQL procedures and functions
15	Creating PL/SQL programs for error handling

NOTE:

1. Creation of sample Database consisting of Employee, Department and Grade tables.
2. Creation of other databases suitable for the course.

WEB PROGRAMMING LAB
(NEW SYLLABUS)

Credits: 2 **Semester: V**
Course Code: CSIT24507 **No. of Lecture hrs: 30**

Course Objectives

- To develop web applications using HTML, JavaScript, XML

Course Outcomes:

- Students will be able to develop dynamic web pages using Java Script, gain knowledge in server-side scripting

1. Programs to demonstrate on basic HTML tags.
2. Programs to demonstrate on different types of lists.
3. Programs to demonstrate frames
4. Programs to demonstrate forms
5. Programs to demonstrate tables.
6. Programs to demonstrate hyperlinks
7. Programs to demonstrate on inline, external, embedded style sheets.
8. Programs to demonstrate control structures.
9. Write a JavaScript program on functions.
10. Write a JavaScript program on arrays
11. Write a JavaScript program on form validation
12. Programs to create a simple login and register form
13. Accept 10 numbers from user and display sum and average in JavaScript
14. Demonstrate the structure of XHTML document.
15. Write a Django program to demonstrate an admin page.
16. Write a Django program to demonstrate templates
17. Write a Django program to demonstrate URLs and views.

LINUX ADMINISTRATION LAB

Credits : 1 **Semester: V**
Course Code : CSIT21509 **No. of Practical Hours: 30**

Objective: To get hands on experience on installations, configuration of server service roles and email servers and clients.

Outcome: Students will be able to demonstrate the core system-administration skills required in Red Hat Enterprise Linux environments.

No. of Hours	TOPICS
1.	Installation of Red hat Enterprise Linux and Fedora.
2.	Creating, deleting and modifying users and group using commands and Graphical tool.
3.	Assigning advanced files permissions, Creating, modifying and deleting ACL's, usage of rpm, tar.
4.	Creating Quotas for users, using dump and restore.Automation of tasks using at and crond.
5.	Configuring FTP Client and Server for uploading and downloading files
6.	Configuring of Postfix mail Server
7.	Configuration of Squirrel Mail to compose the mail on GUI mode
8.	Configuration of NFS server
9.	Configuration of DHCP
10.	GUI Based application to manage n/w via browser webmin administration
11.	Configuration of SAMBA
12-13	Configurations of DNS
14-15	Configuration of Apache Server

MACHINE LEARNING LAB
(NEW SYLLABUS)

Credits: 1 **Semester: V**
Course Code: CSIT24510 **No. of Lecture hrs: 30**

PROGRAMS

1. Linear Regression
2. Logistic Regression
3. K Nearest Neighbour (KNN)
4. Decision Tree algorithm
5. Support Vector Machine (SVM)
6. K Means algorithm
7. Apriori algorithm
8. Artificial Neural Networks (ANN)

CASE STUDIES

Case Study 1: Movie Recommendation System

- Scenario: An online streaming platform wants to enhance user experience by recommending movies based on user preferences.
- Objective: Develop a basic recommendation system using user ratings and movie metadata.
- Tasks:
  - Explore and preprocess movie ratings data.
  - Implement a simple collaborative filtering algorithm.
  - Evaluate the recommendation system' s effectiveness.

Supervised Learning

Case Study 2: Predicting Housing Prices

- Scenario: A real estate agency wants to predict housing prices based on various features like square footage, number of bedrooms, and location.
- Objective: Build a regression model to predict house prices.
- Tasks:
  - Collect and preprocess housing data.
  - Train a linear regression model using scikit-learn.

- Evaluate the model' s performance and interpret coefficients.

Unsupervised Learning

Case Study 3: Customer Segmentation for an E-commerce Platform

- Scenario: An online retailer wants to understand its customer base and tailor marketing strategies.
- Objective: Apply clustering algorithms to segment customers based on their purchasing behaviour.
- Tasks:
  - Analyse and preprocess customer transaction data.
  - Apply K-Means clustering to identify customer segments.
  - Visualize and interpret the customer segments.

Neural Networks

Case Study 4: Image Classification of Animals

- Scenario: A zoo wants to automate the classification of animals in images captured by security cameras.
- Objective: Build a neural network model to classify images into different animal categories.
- Tasks:
  - Collect and preprocess a dataset of animal images.
  - Implement a simple neural network using a deep learning framework.
  - Train the model and assess its accuracy.

INTERNSHIP

Credits: 3 **Semester: V**
Course Code: CSIT18508

Third year students take up an On Job Training in the domain of Networking, PC Hardware Installation and Trouble Shooting, or Network Administration during summer for 4 weeks which carries a total of 40 marks evaluated internally during 5th Semester.

The Criteria for the Internal Evaluation of On Job Training (OJT) Work for 40 marks is as follows:

1.	Attendance	5 marks
2.	Internal Presentation (Presentation and Communication skills)	10 marks
3.	Internal OJT presentation /Practical demonstration (Objectives, work submission, methodology, results, Practical relevance evaluated by the faculty)	15 marks
4.	OJT Report	10 marks

YEAR-WISE AND SEMESTER-WISE DISTRIBUTION OF SUBJECTS
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)
SIXTH SEMESTER
ACADEMIC YEAR 2024-25 OF 2022-25 BATCH (CBCS)

Sl. No.	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs.)	Marks			Credits
						Internal	External	Total	
	THEORY								
1	II	CSIT24601A	Distributed Systems and Cloud Computing (DSE-2)	4	3	40	60	100	4
		CSIT24601B	Internet of Things (DSE-2)						
2	II	CSIT21602A	Web Application Testing (DSE-3)	4	3	40	60	100	4
		CSIT24602B	Python Scripting (DSE-3)						
3	II	CSIT21603	Cryptography and Network Security (Core-18)	4	3	40	60	100	4
	PRACTICALS								
4	II	CSIT21604A	Web Application Testing- Lab (DSE-3)	2	3	40	60	100	1
		CSIT24604B	Python Scripting- Lab (DSE-3)						
5	II	CSIT18605	Major Project (DSE-4)	15	3	40	60	100	6
Total				**29**	-	200	300	500	**19**

***Discipline-Specific Elective (DSE)**

DISTRIBUTED SYSTEMS AND CLOUD COMPUTING
(*Discipline Specific Elective-2)*
(NEW SYLLABUS)

Credits: 4 **Semester: VI**
Course Code: CSIT24601A **No. of Lecture hrs: 60**

Course Objectives

- To enable students with the concepts of distributed environment, uses, replications and security issues.
- To implement Basics, techniques and tools for Cloud Computing.
- To understand any kind of heterogeneous resources over a network using open standards

Course Outcomes:

CO1: To inculcate knowledge on Hardware requirement of distributed systems and communications.
CO2: To illustrate the concepts of Distributed File Systems and Distributed Web-based Systems.
CO3: Identify different types of clouds
CO4: Analyze virtualization and data center working procedure
CO5: Classify public cloud platforms

UNIT-I	**12 Hrs**
1. Introduction: Goals and Types of Distributed Systems Architectures: Architectural Styles	3
2. Architectures versus Middleware, and Self-Management in Distributed Systems.	3
3. Processes: Threads, Virtualization, Clients, Servers, and Code Migration.	3
4. Communication: Remote Procedure Call Message-Oriented Communication, Stream-Oriented Communication, and Multicast Communication.	3
UNIT-II	**12Hrs**
1. Distributed File Systems: Architecture, Processes, Communication, Naming, Synchronization	2
2. Consistency and Replication, Fault Tolerance, and Security.	3
3. Distributed Web-Based Systems: Architecture, Processes	2

4. Communication, Naming, Synchronization	3
5. Consistency and Replication, Fault Tolerance, and Security	2

UNIT-III **12Hrs**

1. Cloud Computing -Introduction, The cloud reference model: Architecture, Infrastructure-and Hardware-as-a-service, Platform as a service, Software as a service.	4
2. Types of clouds: Public clouds, Private clouds, Hybrid clouds, Community clouds, Economics of Cloud	4
3. Open challenges: Cloud definition, Cloud interoperability and standards, Scalability and fault tolerance, Security, trust, and privacy, Organizational aspects	4

UNIT-IV **12Hrs**

1. Introduction and characteristics of virtualized environments: Increased Security, Managed Execution, Portability	3
2. Taxonomy of Virtualization techniques: Execution virtualization	3
3. Virtualization and Cloud Computing	2
4. Pros and Cons of Virtualization	1
5. Technology examples VM ware: full virtualization, Microsoft Hyper V	3

UNIT-V **12Hrs**

1. Amazon web services- Compute services, Storage services, Communication services, Google App Engine-Architecture and core concepts	2
2. Application life cycle, Microsoft Azure - Azure core concepts, SQL Azure	3
3. Cloud applications- Scientific applications- Healthcare: ECG analysis in the cloud	3
4. Business and consumer applications - Media applications Multiplayer online gaming	4

ESSENTIAL READING

1. Andrew S. Tanenbaum and Maarten Van Steen, Distributed Systems, PHI 2nd Edition, 2009.
2. R. Hill, L. Hirsch, P. Lake, S. Moshiri, Guide to Cloud Computing, Principles and Practice‖, Springer, 2013.
3. Buyya, Raj Kumar, Vecchiola, Christian. And Selvi, Thamarai S. 2012. Mastering

Cloud Computing. New Delhi:TMH.

INTERNET OF THINGS
(Discipline Specific Elective- 2)
(NEW SYLLABUS)

Credits : 4 **Semester: VI**
Course Code: CSIT21601B **No. of Lecture Hours: 60**

Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web-based services on IoT devices

Course Outcomes:

CO1: **Identify** the importance of IOT and its applications
CO2: **Differentiate** between IOT and M2M, SDN and NFV
CO3: **Understand** building of IOT devices and Raspberry PI
CO4: **Explain** working of WAMP server and AWS
CO5: Understand applications and analytics of IoT

UNIT - I **12 Hrs**

INTRODUCTION AND CONCEPTS

1. Introduction to Internet of Things –Definition and Characteristics of IoT 3
2. Physical Design of IoT, Logical Design of IoT 3
3. IoT Enabling Technologies 3
4. IoT Levels and Deployment Templates, Domain Specific IoTs – Home Automation Cities, Environment, Agriculture, Industry, health and Lifestyle 3

UNIT – II **12 Hrs**

IoT and M2M

1. IoT and M2M- Introduction to M2M, Difference between IoT and M2M 2
2. SDN and NFV for IoT 3

IoT SYSTEM MANAGEMENT WITH NETCONF-YANG

3. Need for IoT Systems Management, SNMP 2
4. Network Operator requirements, NETCONF, YANG 2
5. IoT Systems Management with NETCONF-YANG 1
6. IoT Platforms Design Methodology: Introduction, IoT Design Methodology 2

UNIT - III **12Hrs**

IoT PHYSICAL DEVICES AND ENDPOINTS

1. Building blocks of IoT device 2
2. Raspberry Pi, About the Board, Linux on Raspberry Pi, Raspberry Pi Interfaces 3
3. Programming Raspberry Pi with Python 5
4. Other IoT devices 2

UNIT - IV **12Hrs**

IoT PHYSICAL SERVERS AND CLOUD OFFERINGS

1. Introduction to Cloud Storage models and Communication API 1
2. WAMP-AutoBahn for IoT, Xively Cloud for IoT 3
3. Python web application framework-Django 3
4. Designing a RESTful web API 3
5. Amazon Web Services for IoT 2

UNIT - V (SOURCE CODE EXCLUDED) **12 Hrs**

1. Python packages of Interest for IoT - JSON, XML, HTTPLib, URLLib, SMTPLib 3

Case Studies Illustrating IoT Design

2. Home Automation- Smart Lighting, Home Intrusion Detection 2
3. Cities- Smart Parking 2

Data Analytics for IoT

4. Introduction, Apache Hadoop 3
5. Using Hadoop MapReduce for Batch Data Analysis 2
6. Apache Spark 2

ESSENTIAL READING

1. Bahga, Arshdeep and Madisetti, Vijay. 2015. **Internet of Things - A Hands-on Approach.** Universities Press ISBN: 9788173719547
2. Richardson, Matt and Wallace, Shawn. 2014. **Getting Started with Raspberry Pi.** O'Reilly (SPD). ISBN: 9789350239759

WEB APPLICATION TESTING
(*Discipline Specific Elective-3)*
(SYLLABUS FOR NEW COURSE)

Credits: 4 **Semester: VI**
Course Code: CSIT21602A **No. of Lecture Hours: 60**

Objectives:

- To study the concepts of web application testing
- To learn different testing methods on server side and client side

Outcomes:

CO1: **Identify** Web application technologies
CO2: **Experiment** using Client-Side Controls
CO3: **Explain** authentication and authorization
CO4: **Implement** SQL injection
CO5: **Develop** Cross-Site Scripting

UNIT – I	**12Hrs**
1. Introduction of Web Applications, Benefits and Security of Web Applications	2
2. The New Security Perimeter and The Future of Web Application Security	3
3. Core Defence Mechanisms: Handling User Access, Handling User Input	3
4. Approaches to Input Handling Sanitization	1
5. Web Application Technologies: The HTTP Protocol and Web Functionality	3

UNIT -II	**12Hrs**
1. Mapping the Application, Enumerating Content and Functionality	2
2. Analyzing the Application identifying Entry Points for User Input	3
3. Bypassing Client-Side Controls, Transmitting Data Via the Client	3
4. Capturing User Data: HTML Forms and Browser Extensions	1
5. Handling Client-Side Data Securely	3

UNIT-III	**12Hrs**
1. Attacking Authentication, Authentication Technologies	2
2. Design Flaws in Authentication	3
3. Implementation Flaws in Authentication	3
4. Attacking Session Management, Weaknesses in Token Generation	1
5. Weaknesses in Session Token Handling and Securing Session Management	3

UNIT-IV	**12Hrs**
1. Attacking Data Stores: Bypassing a Login, Injecting into SQL	2

2.	Exploiting a Basic Vulnerability, Injecting into Different Statement Types	3
3.	Finding SQL Injection Bugs, Finger printing the Database	3
4.	Injecting into NoSQL (MongoDB) and injecting into XPath	1
5.	Subverting Application Logic, Informed And Preventing XPath Injection	3
UNIT-V		**12Hrs**
1.	Attacking Application Logic: The Nature of Logic Flaws	2
2.	Real-World Logic Flaws, Avoiding Logic Flaws	3
3.	Attacking Users: Cross-Site Scripting	3
4.	Varieties of XSS, Reflected XSS Vulnerabilities	1
5.	Stored XSS Vulnerabilities and DOM-Based XSS Vulnerabilities	2

ESSENTIAL READING

1. Dafydd Stuttard, Marcus Pinto. 2011. **The Web Application Hacker's Handbook Finding and Exploiting Security Flaws**. 2nd Edition. John Wiley & Sons Inc.
2. Gupta, Richa. 2021. **Hands-on Penetration Testing for Web Applications. 1st** Edition. BPB Publications. India: New Delhi

PYTHON SCRIPTING
(*Discipline Specific Elective-3)*
(NEW SYLLABUS)

Credits: 4 **Semester: VI**
Course Code: CSIT24602B **No. of Lecture hrs: 60**

Course Objectives

To understand various advanced programming concepts of Python

Course Outcomes:

CO1: Understand the paradigm of scripting
CO2: Usage of Python to work with numbers
CO3: Build Interactive applications with GUI concepts
CO4: Apply network programming and e-mail
CO5: Use XML with Python

UNIT-I	**12 Hrs**
Introduction to Regular Expressions	
1. Regular Expressions	2
2. Values and types	2
3. Variables, storage and control	2
4. Bindings and scope	1
5. Procedural Abstraction and Data Abstraction	3
6. Separate compilation and Module library	2
UNIT-II	**12Hrs**
Numerical Programming	
1. Numbers in Python-Integers, Long Integers, Floating point numbers	3
2. Formatting Numbers and Characters as Numbers	3
3. Mathematics- Arithmetic and Built-in Math functions	2
4. Complex Numbers	2
5. Arrays-The Array Module	2
UNIT-III	**12Hrs**
GUI Programming	
1. Writing a GUI with Python-GUI Programming Toolkits for Python	2

2. Tkinter Introduction	1
3. Creating GUI Widgets with Tkinter	2
4. Resizing the Widget, Configuring Widget Options	2
5. Putting the Widgets to work	2
6. Radio Buttons, Checkboxes and Dialog Boxes	3

UNIT-IV **12Hrs**

Network Programming

1. Understanding Protocols-Comparing Protocols and Programming Languages	2
2. The Internet Protocol Stack and about the Internet Protocol	2
3. Sending Internet E-mail – The E-mail Format	2
4. MIME Messages	3
5. Retrieving Internet e-mail-Parsing a Local Mail Spool with mailbox, Fetching Mail from a POP3 Server with poplib	3

UNIT-V **12Hrs**

Using Python for XML

1. What is XML? - A Hierarchical Markup Language, A Family of Standards. What is a Schema/DTD-What Are Document Models For? Do You Need One?	2
2. Document Type Definitions-An Example DTD, DTDs Aren't Exactly XML, Limitations of DTDs	2
3. Schemas-An Example Schema, Schemas Are Pure XML, Schemas Are Hierarchical, Other Advantages of Schemas	3
4. X Path and HTML as a subset of XML-The HTML DTDs, HTML Parser, XML Libraries Available for Python	2
5. What Is SAX? - Stream-based, Event-driven, What Is DOM? In-memory Access Why Use SAX or DOM - Capability Trade-Offs, Memory Considerations, Why Use SAX or DOM -Capability Trade-Offs, Memory Considerations, Speed Considerations. SAX and DOM Parsers Available for Python- xml. sax, xml. dom.minidom	3

ESSENTIAL READING

1. Beginning Python®: Using Python 2.6 and Python 3.1- James Payne (Unit-2, Unit-3, Unit-4, Unit-5)
2. PROGRAMMING LANGUAGE DESIGN CONCEPTS- David A. Watt with

contributions by William Findlay (Unit-1)

CRYPTOGRAPHY AND NETWORK SECURITY
(NEW SYLLABUS)

Credits : 4 **Semester: VI**

Course Code : CSIT21603 **No. of Lecture Hours: 60**

Objective: To provide issues related to security in modern Networked Computer Systems.

Course Outcomes:

CO1: **Identify** information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
CO2: **Apply** Public Key Cryptographic Technique for securing messages
CO3: **Use** an appropriate message authentication code.
CO4: **Compare** the performance of different message digest algorithms for verifying the integrity of varying message sizes
CO5: **Compare** different IEEE standards and electronic mail security

UNIT-I **12Hrs**

INTRODUCTION

1.	Introduction to Security, Critical Characteristics of Information, The OSI Security Architecture, Security Attacks	2
2.	Security Services and Mechanisms	1
3.	A model for Network Security	1
4.	NSTISSC Security Model, Components of Information Security	2

CLASSICAL ENCRYPTION TECHNIQUES

4.	Symmetric cipher model	1
5.	Substitution Techniques-Caesar Cipher, Mono alphabetic cipher	1
6.	Play fair cipher, Hill cipher, Polyalphabetic cipher, Transposition Techniques	2
7.	The DES encryption, Details of Single Round, Key Generation	1
8.	DES Decryption, The Avalanche Effect, The Strengths of DES	1

UNIT-II **12Hrs**

MORE ON SYMMETRIC CIPHERS

1.	Multiple Encryption and Triple DES	2
2.	Key Distribution, Random Number Generation	2

PUBLIC-KEY CRYPTOGRAPHY AND RSA

1.	The principles of public-key cryptosystems and essential steps of public key Crypto systems, public key encryption to provide Authentication, Applications of	3

	Public key cryptosystems, Requirements for public-key cryptography, Public-key cryptanalysis	
2.	The RSA algorithm-Description of algorithm, computational Aspects, Key generation and Security of RSA	2
3.	RC4Stream Cipher	3
UNIT-III		**12 Hrs**
KEY MANAGEMENT		
1.	Distribution of public keys, public announcement of public keys, publicly available directory, public-key Authority, public-key Certificates, Distribution of secret keys using public-key cryptography	3
2.	Diffie-Hellman key exchange	3
MESSAGE AUTHENTICATION		
3.	Authentication Requirements, Authentication Functions-Message Encryption, Message Authentication code, Hash Functions-Requirements for a hash function, Simple Hash Functions, Birthday Attacks, Block Chaining Techniques	3
4.	Security of Hash functions and MACS-Brute-force attacks, Message Authentication codes	3
UNIT-IV		**12Hrs**
1.	Secure Hash Algorithm (SHA), MD5 Algorithm.	3
2.	Kerberos, X.509 Authentication Services	3
3.	Digital Signatures	3
4.	Whirlpool	3
UNIT-V		**12Hrs**
E-MAIL SECURITY		
1.	E –Mail System	1
2	Pretty Good Privacy, S/MIME.	3
IP SECURITY		
2.	Overview, Architecture, Authentication Header, Encapsulating security payload, combining security associations, key management	3
3.	Modes of IPSEC	2
WEB SECURITY		
4.	Web Security Considerations, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction	3

ESSENTIAL READING

1. Stallings, William. 2005. **Cryptography and Network Security Principles and Practices.** 4th Edition. New Delhi: Prentice Hall of India.

SUGGESTED READING

1. Forouzan, Behrouz A. 2008. **Cryptography and Network Security.** Special Indian Edition**.** New Delhi**:** Tata McGraw-Hill.

WEB APPLICATION TESTING LAB
(*Discipline Specific Elective-3)*
(LAB SYLLABUS FOR NEW COURSE)

Credits: 1 **Semester: VI**
Course Code: CSIT21604A **No. of Practical Hours: 30**

Objective: To get hands on experience on installation and configuration of burp suite and also to identify different vulnerabilities present in web applications.

Outcome: Students will be able to test for different vulnerabilities present in web applications

No. of Hours	Topics
1.	Learn the top 10 vulnerabilities from OWASP
2	Installation of burp suite and configuring burp suite to browser.
3.	Testing for account enumeration and guessable user accounts
4.	Testing for weak password policy
5.	Testing for privilege escalation
6.	Testing for insecure direct object references
7.	Testing for session fixation
8.	Testing for cross site request forgery (CSRF)
9.	Testing for reflected cross site scripting
10.	Testing for stored cross site scripting
11.	Testing for SQL injection
12.	Testing for http verb tampering
13.	Testing for SSL/TLS
14.	Testing for click jacking
15.	Testing for cross origin resource sharing

PYTHON SCRIPTING LAB
(*Discipline Specific Elective-3)*
(NEW SYLLABUS)

Credits: 1 **Semester: VI**
Course Code: CSIT24604B **No. of Lecture hrs: 30**

Course Objectives

- To understand various concepts of advanced programming and implement them

1. Programs on Regular Expressions
2. Programs using Numbers in Python
3. Programs on Arithmetic and Math Built-in functions
4. Program to implement Array Module
5. Programs on GUI Widgets with T-kinter
6. Programs on checkboxes, radio- buttons and dialog boxes
7. Programs to implement XML using SAX and HTML Parser

MAJOR PROJECT

(Discipline Specific Elective-4)

EVALUATION CRITERIA FOR MAJOR PROJECT

Credits : 6 **Semester: VI**
Course Code: CSIT18605 **No. of Practical Hours: 15**

Third year students in the Sixth Semester are required to take up a project work which carries a total of 100 marks i.e. internal 40 marks and external 60 marks.

The criteria for the Internal Evaluation of Project for 40 marks are as follows:

1.	Attendance	5 marks
2.	Review of weekly report	5 marks
3.	Internal Project Presentation–every week end (Presentation & communication skills, objectives, Work submission, methodology, results, and Practical relevance.)	10 marks
4.	Final internal presentation- at the end of semester (50% marks Evaluation done by the internal guide, and 50% marks evaluated by other internal lecturers guiding the projects)	15 marks
5.	Project Report	5 marks

External Evaluation of the Project (60 marks): The Controller of Examination sends the Project Reports to the External Examiner in advance. The External Examiner evaluates the project for 60 marks based on project work done by the student. (The Project Report is evaluated for 40 marks and Viva-voce for 20 marks.)

OFFICE AUTOMATION
(BRIDGE COURSE)
(For first year students admitted from 2020-21 onwards)

Credits : 00 **Semester: I**
Course Code: CSIT **No. of Hours: 15**

Objectives:

- To provide an in-depth understanding in use of office automation packages
- To get acquainted with IT.

Outcomes: Students would be able to prepare documents, spreadsheets, make small presentations and would be acquainted with internet.

UNIT I
OFFICE APPLICATIONS – I
MS Word-Working with Documents, Formatting Documents, Setting Page style, Creating Tables, Drawing, Tools, Printing Documents.

UNIT II
OFFICE APPLICATIONS – II
MS Excel-Entering & Deleting Data, Setting Formula, Formatting Spreadsheets, working with sheets, Creating Charts.

UNIT III
OFFICE APPLICATIONS – III
MS Access: Introduction, planning a Database, Starting Access, Access Screen, creating a New Database, Creating Tables, Working with Forms, creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases viz. MS Excel etc.

UNIT 4:
OFFICE APPLICATIONS - IV
MS Power Point-Creating a presentation, formatting a Presentation, Adding Effects to the Presentation, Printing Handouts.

UNIT 5:

ADVANCED COMMUNICATIONS

Introduction to various devices & Applications: Other than the computers, (electronic gadgets), which are widely using by executives in the Offices – Tablet, Smart Phone – concept of mobile phone and Tablet and their uses – Various applications using by Tablets and Smart Phones such as UC browser, WhatsApp, Maps, Skype.

Essential Readings:

[1] John Walkenbach,Herb Tyson,Faithe Wempen,cary N.Prague,Michael R.groh,Peter G.Aitken, and Lisa a.Bucki. Microsoft Office 2007 Bible. Wiley India pvt.ltd.

[2] A Conceptual Guide to OpenOffice.org 3 - R. Gabriel Gurley- Create Space Independent Publishing Platform, 2008

INFORMATION TECHNOLOGY ACT
(SELF-LEARNING COURSE)

Semester: IV **No. of Hours: 30**

Objectives:

- To keep cybercrimes in check
- To protect sensitive data against potential cyber threats

Outcome: Students will be able gain knowledge on cyber laws and IT security.

UNIT - I **6Hrs**

1. Introduction to Cyber Law & IT Act Overview
2. Cyberspace, Cyber security, Cyber security Policy and Cyber Crime
3. Information Technology Act, Mission and Vision Cyber security Program
4. Cyber Law – Objectives, Emerging Trends of Cyber Law
5. Create Awareness, Areas of Development

UNIT - II **6Hrs**

1. Cyber Law - Intellectual Property Right
2. Types of Intellectual Property Rights
3. Advantages of Intellectual Property Rights
4. Intellectual Property Rights in India
5. Intellectual Property in Cyber Space

UNIT - III **6Hrs**

1. Cyber Law - Strategies for Cyber Security
2. Strategy 1 − Creating a Secure Cyber Ecosystem
3. Strategy 2 − Creating an Assurance Framework
4. Strategy 3 − Encouraging Open Standards
5. Strategy 4 − Strengthening the Regulatory Framework
6. Strategy 5 − Creating Mechanisms for IT Security
7. Strategy 6 − Securing E-Governance Services
8. Strategy 7 − Protecting Critical Information Infrastructure

UNIT - IV **6Hrs**

1. Cyber Law - Policies to Mitigate Cyber Risk
2. Mitigate Risks through Human Resource Development
3. Cyber Law - Network Security, Types of Network Security Devices and Firewalls
4. Antivirus, Content Filtering, Intrusion Detection Systems
5. Cyber Law - I.T ACT, Features of I.T Act

UNIT - V **6Hrs**

1. Scheme of I.T Act, Application of the I.T Act and Amendments Brought in the I.T Act
2. Intermediary Liability, Highlights of the Amended Act
3. Cyber Law – Signatures: Digital Signature
4. Electronic Signature and Digital Signature to Electronic Signature
5. Cyber Law - Offence & Penalties, Offences and Compounding of Offences

ESSENTIAL READING

1. Brian Craig. 2012. **Cyber law: The Law of the Internet and Information Technology.** 1st Edition. Pearson Education.
2. Heather Harrison Dinniss**. 2014.** Cyber Warfare and the Laws of War (Cambridge Studies in International and Comparative Law)**. Cambridge University Press.** Reprint Edition

SUGGESTED READING

1. Saurabh Sharma. 2010. **Information Security and Cyber Laws Paperback.** Vikas Publishing House Pvt. Ltd.

POWER SHELL SCRIPTING
(ADD-ON COURSE)

Semester: VI **No. of Hours: 30**

Objectives:

- To enable students, learn is a command-line shell and Scripting Language designed especially for system administration

Outcome: Students will be able to control and automate the administration of the Windows operating system and applications that run on Windows Server environment.

UNIT - I	**6 Hrs**
1. Introduction to PowerShell ISE	1
2. PowerShell Basic Commands	1
3. PowerShell - Environment Setup	2
4. Difference between PowerShell and PowerShell ISE	1
5. Introduction to PowerShell Console, Scripting File and the Command Module	1

UNIT- II	**6 Hrs**
1. PowerShell Basic Commands	2
2. PowerShell - cmdlets: Cmdlet vs Command	1
3. PowerShell - Files and Folder Operations	1
4. PowerShell - Date and Time Operations	1
5. PowerShell - File I/O Operations	1

UNIT- III	**6 Hrs**
1. PowerShell - Advanced Cmdlets	2
2. PowerShell - Scripting and Features	1
3. Variables Creating and Using variable and Getting information of variable	1
4. PowerShell - Special Variables	2

UNIT- IV	**6 Hrs**
1. Introduction PowerShell – Operators and Arithmetic Operators	1
2. Comparison Operators, Assignment and Logical Operators	1
3. Looping: for loop, forEach loop, while loop and do while loop	1
4. Conditions if and if else statement, nested if statement and switch statement	1
5. Array: Declaring Array Variables and Processing Arrays	2

UNIT- V	**6 Hrs**
1. PowerShell - Hash tables Declaring hash table Variables Processing Hash table	2

2. Regex (Match Characters, Match Character Classes and Match Quantifiers) 1
3. PowerShell – Backtick 1
4. PowerShell –Brackets: Parenthesis brackets, Braces brackets and square brackets 1
5. PowerShell - Alias: Creating Alias and Getting Alias 1

ESSENTIAL READING

1. Thomas Lee .2017. **Windows Server 2016 Automation with PowerShell Cookbook - Second Edition: Automate manual administrative tasks with ease** 2nd Revised Edition

SUGGESTED READING

1. Chris Dent, Brenton J.W. Blawat 2017 **Mastering Windows PowerShell Scripting: One-stop guide to automating administrative tasks**, 2nd Edition 2nd Revised Edition
2. Martin Machado, Prashant G Bhoyar **PowerShell for Office 365: Automate Office 365 administrative tasks Paperback** – July 26, 2017