

 **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**INNOVATIVE ASSIGNMENTS**

**ACADEMIC YEAR: 2024-2025 SEM-I**

 **OPERATING SYSTEMS II YEAR I SEM**

1. **Create**a virtual memory manager that supports demand paging and write-back caching. Include a visualization of how pages are loaded and replaced during program execution.**(CO4)**
2. **Implement** a file locking mechanism that allows multiple processes to safely read and write to files concurrently without data corruption.**(CO5)**

 **DATABASE MANAGEMENT SYSTEMS II YEAR I SEM**

1.**Create** a normalized relational database schema for a modern application like a food delivery platform. Ensure removal of redundancy and optimize for efficient querying.**(CO3)**

2.**Analyze** the impact of using **indexes** on large databases for query optimization. Conduct experiments to compare execution times with and without indexing and explain the results. **(CO5)**

**OBJECT-ORIENTED PROGRAMMING THROUGH JAVA II YEAR I SEM**

1.**Create** a Java-based chat application using sockets to enable peer-to-peer communication. Include features like multiple client handling and message timestamps. **(CO5)**

2.**Create** a modular Java application that uses multithreading to simulate a real-time ticket booking system, ensuring thread safety and concurrency control. **(CO3)**

 **ARTIFICIAL INTELLIGENCE III YEAR I SEM**

1. **Design** a recommendation system for an e-commerce platform that uses collaborative filtering or content-based filtering techniques. Implement a working prototype that suggests products to users based on their past behavior or preferences.**(CO2,CO3)**

2**. Design** and **Implement** an AI-based Disaster Response System.**(CO3,4,5)**

 **COMPUTER NETWORKS III YEAR I SEM**

1. **Create** a simulation of a hybrid network topology using NS3 or Packet Tracer, and document its performance in various congestion scenarios. **(CO1)**

2. **Analyze** the impact of varying packet sizes on TCP and UDP throughput under different network loads. Present your findings graphically. **(CO4)**

 **INTERNET OF THINGS IV YEAR I SEM**

1. **How** Cyber-security might affect the Development and Implementation of the Internet of Things (IoT), especially in USA? **(CO2)**

2.**What** is the Current Federal Regulatory Role of USA Government pertinent to Internet Of Things (IoT)? **(CO1)**

 **INFORMATION SECURITY AND RISK MANAGEMENT IV YEAR I SEM**

1. **How** can artificial intelligence (AI) revolutionize risk management in information security? **(CO4)**

2. **What** role does blockchain technology play in enhancing information security and managing risks? **(CO5)**