

## **Lab 6: Efficient Logistics Scheduling and Load Balancing**

### **Lab Outcome:**

1. To identify the suitable data structure for the given application
2. To implement the data structure for given application.
3. To Analyze algorithms with respect to time and space complexity.

### **Case Study:**

A large logistics company faces the following challenges:

1. Efficiently schedule delivery trucks based on priority and delivery deadlines.
2. Handle real-time changes, such as traffic delays, rerouted trucks, and increased delivery volumes.
3. Ensure efficient load balancing across multiple distribution hubs.
4. Allow dynamic merging of delivery queues when combining or splitting routes.

Requirements:

- Prioritize deliveries based on urgency and distance.
- Support dynamic merging and balancing of delivery schedules between hubs.
- Adjust priorities and reschedule in real-time when disruptions occur.

### **Submission Guideline:**

1. Write a report including the following points:

Title, Suitable Data Structure to solve the problem, Operations, its time and space complexity, Conclusion.

2. Upload the Zip File, contains code file (.java/.cpp/.py/.c), Screenshot file and a report (PDF).
3. Ensure the code is well-commented and modular.