

## **IE 5401 Industrial Logistics**

Workload: 3-0-0-3-4

**Descriptions :** This module provides a sound basis for understanding the fundamental nature and functional areas of logistic systems, and the activities concerned with the efficient management of industrial logistics. Topics covered are fundamentals of industrial logistics, components of logistic systems, logistics policy, transport network systems, vehicle routing and scheduling, fleet size determination and crew scheduling.

### **Syllabus :**

1. Fundamental of Industrial Logistics
  - what is logistics
  - logistics management and its challenge
  - components of logistics systems
  - logistics activities
  - logistics composite modeling
2. Logistics Problems and Exemplary Models
  - single sourcing, multi-modal, cross-docking, distribution centers and location
  - vehicle routing, air cargo routing
  - revenue management principles and practice
  - crew scheduling, shift planning, rosters, work rules, quality of life issues
  - railroad logistics, container management, trucking, vendor-managed inventory
3. Inventory and Logistics Strategies
  - introduction
  - inventory models
  - uncertainty and risk
  - contemporary logistics strategies

### **References :**

1. Artiba A., and S.E. Elmaghraby (eds.), The Planning and Scheduling of Production Systems: Methodologies and Applications, Chapman & Hall, 1997.
2. Barnhart C., E.Johnson, G. Nemhauser, G. Sigismondi, and P. Vance, "Formulating a Mixed-Integer Distribution Problem to Improve Solvability", Operations Research 41, pp.1013-1019, 1993.
3. Clarke L., C. Hane, E. Johnson, and G. Nemhauser, "Maintenance and Crew Considerations in the Fleet Assignment Problem", Transportation Science 30, No.3, pp.249-260, August 1996.

4. Frazelle E., Supply Chain Strategy, McGraw-Hill, 2002.
5. Martin C., Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service (2<sup>nd</sup> ed.), London: Financial Times Pitman Publishing, 1998.
6. Mairs T., G. Wakefield, E. Johnson, and K. Spielberg, "On Production Allocation and Distribution Problem," Management Science, Vol. 24, No.15, pp.1622-1630, 1998.
7. Ratliff D., J Vande Vate, and M. Zhang, "Network Design for Load-driven Cross-docking Systems", TLI web page.
8. Shapiro J., Modeling the Supply Chain, Duxbury, 2001.
9. Simchi-Levi D., P. Kaninsky and E. Simchi-Levi, Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies, McGraw-Hill, 2000.