Air Cargo Logistics Management

Course duration: 30 hrs (20 sessions)

Course Description: This course aims to impart both theoretical and practical knowledge related to air cargo handling and management to upskill students and logistics professionals. It has been designed keeping in mind the various techno-managerial aspects that need to be implemented by the participants. The course also explores how new and existing business strategies related to air cargo handling can be improved through the introduction of technologies, digital systems and data analytics.

Target Audience: Senior and Middle Level Management

Relevant Industry: Air Cargo handling industry, Aviation Industry, Logistics Industry

Course Objectives

- To provide exposure about the best practices across industry.
- To create business value through optimization of different functions of air cargo operations.
- To provide exposure about the impact of automation and digitization of supply chain processes.

Learning Outcomes: After completion of the course, participants would be able to:

- Demonstrate the concept of air cargo operations.
- Build data analytics tools and techniques for air cargo handling and management.
- Learn best practices across the industry.
- Illustrate how technology is transforming traditional ways of doing business.

Pedagogy/Teaching Method: Lectures, Case Studies

Session Plan:

Module No.	Session No.	Topics	Readings / Case Study

Module 1: Basics of Air Cargo Operations (6 hours)	1-4	• Understanding basics of air cargo operations
		• Activity/operation of key players in air cargo service such as
		  ✓ Shipper,
		  ✓ Forwarder
		  ✓ Airline
		  ✓ Airports
			1. Gorman, M. F., Clarke, J. P., Gharehgozli, A. H., Hewitt, M., de Koster, R., & Roy, D. (2014). State of the Practice: A Review of the Application of OR/MS in Freight Transportation. *Interfaces*, 44(6), 535-554.
			
			2. Feng, B., Li, Y., & Shen, Z. J. M. (2015). Air cargo operations: Literature

		✓ Consignee • Coordination and contract in air cargo supply chain • Complexity in air cargo operations	review and comparison with practices. *Transportation Research Part C: Emerging Technologies*, 56, 263-280.
Module 2: Role of Analytics & Digitization in Air Cargo Management (15 Hours)	5-14	• Demand analytics • Capacity planning • Revenue management • Terminal operations & Cargo Handling • Fleet routing and flight scheduling • Decision making under risk and uncertainty • Applications of various AI/ML and optimization models in air cargo operations • Information technology and GIS for managing air cargo operations	3. Barz, C., & Gartner, D. (2016). Air cargo network revenue management. *Transportation Science*, 50(4), 1206-1222. 4. Lulli, G., Odoni, A., & Santos, B. F. (2020). Introduction to the special section: Air transportation systems planning and operations under uncertainty. *Transportation Science*, 54(4), 855-857. 5. Shang, Y., Dunson, D., & Song, J. S. (2017). Exploiting big data in logistics risk assessment via bayesian nonparametrics. *Operations Research*, 65(6), 1574-1588.

Module 3: Case Studies/ Real life applications (9 Hours)	**15-20**	• Cold Logistics – food, flower & medicines
		• Heavy-lift air transportation
		• Humanitarian operations using Air Transport
		• Applications of Geospatial Technologies in Air Cargo Handling and Management
		   ➢ Sustainable Intermodal Freight Transportation
		   ➢ Optimizing Periodic Maintenance Operations
			6. Dayarian, I., Savelsbergh, M., & Clarke, J. P. (2020). Same-day delivery with drone resupply. *Transportation Science*, 54(1), 229-249.
			7. Comer, B. (2009). Sustainable intermodal freight transportation: applying the geospatial intermodal freight transport model. *Rochester Institute of Technology, USA*.

Reference Books

- Sales, M. (2016). Air cargo management: Air freight and the global supply chain. Taylor & Francis.
- Sales, M. (2016). Aviation logistics: the dynamic partnership of air freight and supply chain. Kogan Page Publishers.
- Thompson, J. F., Brecht, P. E., & Hinsch, T. (2002). Refrigerated trailer transport of perishable products (Vol. 21615). UCANR Publications.