

- **Simulations:** Use of cloud-based simulation tools for digital twin applications and scenario planning.
- **Group Projects:** Design and implement a digital transformation strategy for a supply chain using emerging technologies.

SWAYAM Reference: SWAYAM references for blended learning (as NEP 2020 recommends integrating online modules. Since SWAYAM directly doesn't have a course titled " *Emerging Technologies in Materials Management* ", the closest and most relevant course available is:

https://onlinecourses.nptel.ac.in/noc20_mg70/preview

https://onlinecourses.nptel.ac.in/noc22_mm20/preview

https://onlinecourses.nptel.ac.in/noc23_mg89/preview

https://onlinecourses.nptel.ac.in/noc21_mg45/preview

Semester-VIII
DISCIPLINE SPECIFIC ELECTIVE (DSE-8.1)
Lean Inventory and Operations Management
Offered by Commerce Department, College of Vocational Studies

Credit Distribution, Eligibility and Pre-requisites the Course

Course Title & Code	Total Credits	Lectures	Tutorial	Practical	Eligibility	Prerequisite of the course
Lean Inventory and Operations Management	4	3	1	-		

Learning Objectives:

1. **Understand Lean Principles:** Comprehend the fundamentals of lean thinking and the Toyota Production System (TPS).
2. **Optimize Processes:** Apply value stream mapping and process optimization techniques to enhance operational efficiency.
3. **Implement Pull Systems:** Utilize pull-based inventory systems, including Just-in-Time (JIT) and Kanban, to streamline inventory management.
4. **Foster Continuous Improvement:** Promote a culture of continuous improvement through methodologies like Kaizen and Total Productive Maintenance (TPM).
5. **Leverage Digital Tools:** Integrate digital technologies for real-time inventory tracking and data-driven decision-making.

Learning Outcome:

1. Explain the principles of lean thinking and the Toyota Production System (TPS).
2. Develop value stream maps to identify and eliminate waste in processes.
3. Design and implement pull-based inventory systems using JIT and Kanban.
4. Apply continuous improvement techniques such as Kaizen and TPM to enhance operational performance.
5. Utilize digital tools for real-time inventory management and performance analysis.

Unit	Contents	
Unit I	Lean Principles and Sustainable Practices: Understanding lean thinking, the Toyota Production System (TPS), waste elimination, focusing on sustainable practices like reducing energy consumption and material waste, and integrating environmental sustainability within lean principles.	(10 Hours)
Unit II	Value Stream Mapping and Process Optimization: Mapping current state and future state, identifying bottlenecks, utilizing critical thinking to optimize flow, applying eco-efficient process techniques, and leveraging digital tools to visualize and optimize the value stream.	(11 Hours)
Unit III	Pull Systems, Kanban, and Digital Inventory Management: Fundamentals of pull-based inventory systems, Just-in-Time (JIT) replenishment, Kanban boards, and the use of digital technologies (e.g., IoT and cloud platforms) for real-time inventory tracking.	(12 Hours)
Unit IV	Continuous Improvement and Innovation: Kaizen, 5S, Poka-Yoke, Total Productive Maintenance (TPM), fostering innovation and problem-solving in continuous improvement, introducing smart technologies like robotic automation for maintenance, and data-driven decision-making for improved performance.	(12 Hours)

Suggestive Reading Materials/References:

1. **Womack, J.P., & Jones, D.T.** (2003). *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. Free Press.
2. **Ohno, T.** (1988). *Toyota Production System: Beyond Large-Scale Production*. Productivity Press.
3. **Shingo, S.** (1989). *A Study of the Toyota Production System from an Industrial Engineering Viewpoint*. Productivity Press.
4. **Liker, J.K.** (2004). *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. McGraw-Hill.
5. **Hines, P., Holweg, M., & Rich, N.** (2004). *Learning to Evolve: A Review of Contemporary Lean Thinking*. International Journal of Operations & Production Management.
6. **Bicheno, J., & Holweg, M.** (2009). *The Lean Toolbox: The Essential Guide to Lean Transformation*. PICSIE Books.
7. **Slack, N., Chambers, S., & Johnston, R.** (2010). *Operations Management*. Pearson Education.
8. **Heizer, J., & Render, B.** (2013). *Operations Management*. Pearson Education.
9. **Goldratt, E.M.** (1990). *The Haystack Syndrome: Sifting Information Out of the Data Ocean*. North River Press.
10. **Monden, Y.** (2011). *Toyota Production System: An Integrated Approach to Just-In-Time*. CRC Press.

Teaching Pedagogy/Methodology:

- **Lectures:** Introduction to lean principles, TPS, and process optimization techniques.
- **Case Studies:** Analysis of real-world applications of lean inventory and operations management.
- **Workshops:** Hands-on sessions on value stream mapping, JIT implementation, and Kanban systems.
- **Simulations:** Use of digital tools for inventory management and performance analysis.
- **Group Projects:** Collaborative projects to design and implement lean systems in simulated environments.

SWAYAM Reference: SWAYAM references for blended learning (as NEP 2020 recommends integrating online modules. Since SWAYAM directly doesn't have a course titled " *Lean Inventory and Operations Management* ", the closest and most relevant course available is:

https://onlinecourses.swayam2.ac.in/imb24_mg119/preview

https://onlinecourses.nptel.ac.in/noc20_mg06/preview

https://onlinecourses.nptel.ac.in/noc20_mg17/preview

https://onlinecourses.nptel.ac.in/noc24_hs128/preview

Semester-VIII
DISCIPLINE SPECIFIC ELECTIVE (DSE-8.1)
Advanced Logistics and Distribution Strategies
Offered by Commerce Department, College of Vocational Studies

Credit Distribution, Eligibility and Pre-requisites the Course

Course Title & Code	Total Credits	Lectures	Tutorial	Practical	Eligibility	Prerequisite of the course
Advanced Logistics and Distribution Strategies	4	3	1	-		

Learning Objectives:

- To explore advanced logistics concepts and strategies for optimizing the movement of goods within the supply chain.