Introduction

Enhance the decision-making processes for operation and maintenance professionals through a comprehensive curriculum that covers a wide array of topics, including **project management**, **business analysis**, **data management**, and **maintenance management**. This course is specifically designed to integrate industry-leading practices in **operations management**, ensuring that participants gain the knowledge and tools necessary to make informed, effective decisions and conduct thorough risk analysis.

The **Decision Analysis, Operations, and Maintenance Management** program emphasizes **lean thinking** and decision-making techniques, focusing on improving responsiveness to customer requirements. Participants will learn how to prioritize alternatives for resource allocation, optimize asset management, and utilize decision analysis tools such as decision tree analysis and Monte Carlo simulations. The course is essential for professionals looking to elevate their operational efficiency and make data-driven decisions.

Targeted Groups

This course is aimed at:

- **Operation Professionals**
- **Maintenance Professionals**
- **Reliability Professionals**
- **Key Operations Supervisors**
- **Internal Improvement Consultants**

Course Objectives

By the end of the **Decision Analysis, Operations, and Maintenance Management** course, participants will be able to:

- Improve **productivity** through better, timelier information.
- Understand how **world-class organizations** solve common asset management problems.
- Optimize **planning and scheduling resources**.
- Conduct **optimized failure analyses**.
- Optimize **asset management budgets** by reducing unplanned equipment failures.
- Develop a practical **action plan** to integrate technologies into operational strategies and measure benefits.

Targeted Competencies

Upon completion of this training, participants will have developed the following competencies:

- Breaking down a problem into its **constituent parts** using a hierarchical framework.

- Ranking alternatives and **establishing priorities** to approach problems formally.
- Applying **Multi-Criteria Decision-Making (MCDM)** to real-world problems.
- Gaining an understanding of **operational research** and **management science** methods.
- Enhancing decision-making with clear **goals** and **criteria** and demonstrating how to measure and rank them.

Course Content

Unit 1: Introduction to Decision Making

- The **scope** and **significance** of decision-making.
- The **decision-making process**: Selecting between options by projecting likely outcomes.
- **Decision Tree Analysis**: Modeling low-probability, high-consequence events and valuing additional information.
- **Monte Carlo Simulation**: Understanding optimization advantages and limitations.

Unit 2: Implementing Multiple Criteria Decision Analysis

- The **definition** of decision analysis and why **bad decisions** are made.
- Problems with traditional decision-making methods.
- **Guidelines for good decision analysis**.

Unit 3: The Analytic Hierarchy Process (AHP)

- **Introduction to AHP**: The comparative matrix.
- **Consistency analysis** and **sensitivity analysis** in decision-making.
- **Benefit/cost analysis** and **resource allocation**.
- Applications of AHP in **maintenance strategy**, **highway planning**, and the **Concorde case**.

Unit 4: Risk Management through Failure Mode & Effect Analysis (FMEA)

- Understanding **risk mitigation** and **fault tree analysis**.
- Calculating **Risk Priority Number (RPN)** and using the **Criticality Matrix**.
- **Equipment criticality grading** and risk assessments in the **oil and gas industry**.
- Modeling the **reliability of systems**, including **series** and **parallel systems**.
- The concept of **redundancy** and when to apply it.

Unit 5: MRP and ERP Systems

- Introduction to **ERP** systems and their development.
- The evolution from **MRP** to **MRPII systems**.
- Key concepts in **planning and control**, including the **Bill of Materials** and **Master Production Schedule**.

Unit 6: Optimum Performance Measures

- Addressing the **challenges of performance measures** in maintenance.
- Creating a **continuous improvement process** for performance measures.
- Identifying **best and worst practices** in performance management.

Unit 7: The Overall Equipment Effectiveness (OEE) as a Source of Best Practice in Maintenance

- The **advantages of OEE** as an improvement program.
- Implementing **lean maintenance** using OEE.
- Analyzing the **Six Big Losses** and their impact on operational efficiency.

Unit 8: The House of Quality

- Basics of **design evaluation** and converting the **voice of the customer** into engineering solutions.
- Practical applications of the **House of Quality** in real-world cases.

Unit 9: Decision Analysis for Optimization of Maintenance Activities

- Maximizing the use of **Computerized Maintenance Management Systems (CMMS)**.
- Identifying the **benefits** of CMMS in optimizing maintenance.
- Making **optimum decisions** for maintenance policies and managing **responsive maintenance**.
- Key features of **next-generation maintenance systems** and transforming **data into actionable decisions**.

Conclusion

The **Decision Analysis, Operations, and Maintenance Management** course equips professionals with the tools and techniques needed to make informed decisions, optimize asset management, and enhance the efficiency of maintenance activities. With a strong focus on data-driven decision-making, risk management, and operational analysis, this course prepares participants to apply best practices in their areas of responsibility, integrating them into broader strategies for long-term success.