

SSLC, HSE, DIPLOMA, B.E/B.TECH, M.E/M.TECH, MBA, MCA

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## **OME753 SYSTEMS ENGINEERING**

### DETAILED SYLLABUS

#### **OBJECTIVE:**

- To introduce system engineering concepts to design the manufacturing system for optimum utilization of source for effective functioning.

#### **UNIT I INTRODUCTION**

Definitions of Systems Engineering, Systems Engineering Knowledge, Life cycles, Life-cycle phases, logical steps of systems engineering, Frame works for systems engineering.

#### **UNIT II SYSTEMS ENGINEERING PROCESSES**

Formulation of issues with a case study, Value system design, Functional analysis, Business Process Reengineering, Quality function deployment, System synthesis, Approaches for generation of alternatives.

#### **UNIT III ANALYSIS OF ALTERNATIVES- I**

Cross-impact analysis, Structural modeling tools, System Dynamics models with case studies, Economic models: present value analysis – NPV, Benefits and costs over time, ROI, IRR; Work and Cost breakdown structure,

#### **UNIT IV ANALYSIS OF ALTERNATIVES–II**

Reliability, Availability, Maintainability, and Supportability models; Stochastic networks and Markov models, Queuing network optimization, Time series and Regression models, Evaluation of large-scale models

#### **UNIT V DECISION ASSESSMENT**

Decision assessment types, Five types of decision assessment efforts, Utility theory, Group decision making and Voting approaches, Social welfare function; Systems Engineering methods for Systems Engineering Management,

#### **OUTCOMES:**

- The Student must be able to apply systems engineering principles to make decision for optimization.

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- Hence an understanding of the systems engineering discipline and be able to use the core principles and processes for designing effective system.

**TEXT BOOK:**

1. Andrew P. Sage, James E. Armstrong Jr. "Introduction to Systems Engineering", John Wiley and Sons, Inc, 2000