Michigan Alliance for Greater Mobility Advancement

Course Title: Systems Engineering

Course Length: 2 days

Time Online: N/A

Time in Class: 8 hours (Lab and Class) per day

Time in Lab: 8 hours

Class Size: Minimum 10 / Maximum 20

Price Per Student: $1,035.00*

Location: Company Site

Course Description:

Systems engineering is a growing field. It may be a primary career path for an engineer or scientists, or it can be a part of other engineering responsibilities in the mechanical, electrical, civil, environmental, materials, industrial/manufacturing, chemical and any other engineering discipline. Understanding of the entire system as opposed to a subset of the system or outdated silo thinking, engineers and scientist need to have a more holistic view of their contributions to systems within their organizations.

This introductory course to systems engineering focusses on a number of topics to include: introduction to systems engineering, needs analysis, system design process, integration and evaluation, production, operations and support, and life cycle costing considerations.

This course is well suited to engineers, managers, technicians, and other staff including those with primary roles in marketing, service, etc.

Lab Projects Description:

Hands-On Experimental Lab projects are not included in this course; however, it does include many hands-on applications that are conducted within the classroom setting. These are shown in the syllabus below.

Course Learning Objectives:

- After completing this program, the participant will be able to:
- Appreciate systems engineering as a discipline.
- Describe the origins of systems engineering.
- Apply problem-solving techniques to systems problems that involve human-based uncertain-ties.
- Define the systems design process.
- Understand the importance of production, operations, and ongoing activities associated with systems.

* Price based on minimum enrollment, subject to change

- Apply systems engineering design and analysis techniques.

Course Content/Syllabus

- Introduction to system engineering
  - What is systems engineering
  - Origins
  - Examples
  - Profession and career development
  - System science and engineering
- Systems engineering
  - Perspectives
  - Domains
  - Engineering fields
  - Approaches
  - Activities and products
- Needs analysis
  - New system
  - Operations analysis
  - Functional analysis
  - Feasibility definition
  - Needs validation
  - Operational requirements
- System design process
  - Conceptual system design
  - Functional flow block diagrams
  - Preliminary system design
  - Detail design and development
  - System test, evaluation, and validation
- Integration and evaluation
  - Integrate, test, and evaluate
  - Test planning
  - System integration
- Production
  - System engineering in the plant
  - Production engineering
  - Move from development to production
- Operations and support
  - Installation
  - Maintenance
  - Upgrades
  - Service support
  - Major system upgrades
  - Human factors considerations
- Life cycle costing
- Student Assessment (Exam)
- Course Evaluations