Michigan Alliance for Greater Mobility Advancement

Course Title: Product Design and Engineering

Course Length: 2.5 days

Time Online: N/A

Time in Class: 20 hours

Time in Lab: N/A

Class Size: Minimum 10 / Maximum 30

Price Per Student: $2,580.00*

Location: Company Site

Course Description:
This course prepares participants for Industrial and Systems Engineering roles in product engineering by providing them with academic understanding and hands-on experience of the product engineering tasks and functions over the development lifecycle, and the applicable methods, procedures and techniques.

The course poses a series of questions in product development that a product engineer should know to ask and be able to answer. Approaches to the questions and the significance of the outcomes are elucidated using real-world, practical product developments. Participant projects will demonstrate understanding of the questions and solution approaches by applying them in real-world product development stages.

Major engineering functions and artifacts to be introduced may include: product definition; form-fit-function constraints, "house of quality" and set-based design approaches for collaborative value engineering; requirements engineering and documentation; product architecting and documentation; Design for X (goals, strategies and methods for reliability, safety, functional effectiveness, manufacturability, maintainability, acquisition and life cycle cost, etc.); axiomatic and robust design; system modeling and analysis; prototyping; tradeoff studies; test and evaluation strategies and experimental design. Course topics are based upon participant experience and expectations.

Lab Projects Description:
N/A. All coursework completed in class or as homework.

Course Learning Objectives
At the end of the program, participants will be able to:

- Identify the stage, diagnose the status and identify product engineering needs of an engineering development program.
- Select and apply appropriate engineering design and analysis methods, procedures and tools to address design and engineering responsibilities, form-fit-function, product concept, key

* Price based on minimum enrollment, subject to change

requirements and constraints, engineering breakdown structure, project work breakdown structure, time estimation, identifying engineering development dependencies.

- Select and apply appropriate engineering design and analysis methods, procedures and tools to address interface and performance requirements, system model-test-evaluation, engineering documentation (e.g. specifications, design requirements, architecture, bill of materials, supplier selection, instructions for assembly, operation, maintenance and disposal, test and evaluation).
- Explain communication needs and coordination events with project management, engineering management, suppliers, customers, specialty engineering teams, and parallel business functions.

Course Content/Syllabus

The course consists of 20 hours that can be scheduled in four 5-hour blocks or five 4-hour blocks. Participants will be evaluated on a mid-term project report and presentation (30%), final exam project report and presentation (50%), and class participation (20%).