



Automotive Vehicle Design Process

This course is developed to give an overview of the coordinated effort it takes to develop an automobile from the very early concept idea, through feasibility, validation, launch and continuous improvement initiatives while in production. We discuss the key processes, tools, techniques and methodologies utilized in vehicle development. We then expand on the multiple quality systems that are put in place to ensure compliance to the engineering specifications.

Key players in the industry are discussed and understood along with the roles and responsibilities they assume to bring a vehicle system into production. We will detail the Original Equipment Manufacturers (OEM), various types of suppliers, individuals that perform the tasks and how they are all orchestrated to ensure compliance to the programs scope, time, budget and quality targets required for the vehicles targeted specific market.

- First, a basic overview of developing a new vehicle is discussed and understood outlining all the phases and approval points of the product development process.
- Next, participants will focus on key selected tools and techniques that are used by the technical personal to ensure the scope, timing and budget elements are managed along with setting the quality targets.
- Lastly, we tour key supplier operations and the Ford Rouge assembly plant to have a basic understand of each of the plant operations and the important role they play in the product development process.



Course Syllabus

I IDENTIFYING INFORMATION

Automotive Product Development Process
Basic understanding of the automotive industry
40 total contact hours
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BS in Vocational Industrial Education
MA in Business Management
30 years in the product design engineering profession
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II <u>REFERENCE MATERIALS</u>

- 1. A Guide to the Project Management Body of Knowledge, by
- 2. Project Management Institute 3rd Edition, ISBN 193069945-X
- 3. Advanced Product Quality Planning and Control Plan, 2nd Edition by AIAG
- 4. Potential Failure Mode and Effects Analysis, 4th Edition by AIAG
- 5. Production Part Approval Process, 4th Edition by AIAG
- 6. Measurement Systems Analysis, 3rd Edition by AIAG
- 7. Statistical Process Control, 2nd Edition by AIAG
- 8. Complete fundamentals of Project Management as outlined by the industry standard from the Project Management Institute (PMI). <u>www.pmi.org</u>

III COURSE GOALS AND OBJECTIVES

- 1. Understand the vehicle development process and the key players that do the work
- 2. Understand the various detailed tools, techniques and methodologies employed to develop the technical aspects of the vehicle
- 3. Understand the quality assurance and control efforts to ensure compliance to the various specifications
- 4. Understand and tour manufacturing plants for a hands-on view of the operations
- 5. Understand and tour checking fixture plant for a hands-on view of the operations
- 6. Understand and tour assembly plant for a hands-on view of the operations



IV <u>METHODOLOGY</u>

This course is a micro view of the vehicle product development process and gives a detailed understanding of each key player's role and responsibility throughout the process. Each module will introduce new material that will prepare the student for the projects to be completed.

<u>Lectures</u>

Each detailed subject will be presented in a lecture format outlining the theory and standardized accepted methodology. A PDF file of the lecture material will be provided for the student's personal use as reference material. Lecture note outlines will be distributed to the students for each lecture to help the student capture personal notes. A short video showing the concept covered and a discussion regarding application.

Specific Industry Examples

Real life industry examples will be covered that detail out the application of the theory to demonstrate how different companies apply these tools and techniques. This will give the students a clear understanding of how and why these techniques are utilized at different companies and industries in different manners.

Specific Company Application

As a summary of the training we will see these tools and techniques in action while we tour selected suppliers and tour the final assembly plant at the Ford Rouge complex.



V COURSE OUTLINE & ASSIGNMENTS

Module 1

Automotive Product Development Acronyms Vehicle Development Process Parts of the Automobile System Defining the Vehicle System Program Management

Module 2

Technology Tools & Techniques Management Tools & Techniques Sheet Metal Stamping Review Quality Systems

Module 3

Plastic Injection Molding Review Quality Techniques Checking Fixtures Review Quality Detailed Tools

Module 4

Assembly Plant Tour at Ford Rouge Plant Wrap Up discussion PowerPoint lecture MS Excel discussion PowerPoint lecture PowerPoint lecture PowerPoint lecture PowerPoint lecture

PowerPoint lecture PowerPoint lecture Plant tour PowerPoint lecture

Plant tour PowerPoint lecture Plant tour PowerPoint lecture

Plant tour PowerPoint lecture