

# **“FUNDAMENTALS OF COLD FORGING”**

**PRESENTED BY:  
DR. VIJAY NAGPAL  
METAL FORMING SYSTEMS, INC.  
CANTON MI -48187**

## FOLLOWING TOPICS WILL BE COVERED:

1. Introduction to Metal Forming
2. Introduction to Cold Forging Process
3. Basics of Metal Deformation
4. Material properties and behavior
5. Machines for Cold Forging
6. Principles of forging sequence design
7. Basic forming processes
8. Sequence design rules
9. Preform shapes
10. Forming sequence layout
11. Practical considerations in sequence design
12. Load and design calculations
13. Introduction of Finite Element Analysis (FEA) for simulation of Forging Processes
14. Tool design and die stress analysis
15. Software program NAGFORM for sequence design
16. Validation of design through FEA simulation – NAGSIM software program

## COURSE SCHEDULE:

August 6<sup>th</sup> – 9AM – 5PM  
August 7<sup>th</sup> – 9AM – 5PM  
August 8<sup>th</sup> – 8AM – 3PM

## TRAINING LOCATION:

Metal Forming Systems, Inc.  
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## SUGGESTED HOTELS:

Hampton Inn And Suites Detroit/Canton  
1950 Haggerty Road North, Canton, MI 48187

Comfort Suites Canton  
5730 Haggerty Road, Canton, MI 48187



## INSTRUCTOR'S BACKGROUND:

- Ph.D. & ME in Mechanical Engineering – Georgia Institute of Technology, Atlanta
  - Thesis Subject - Analysis of Metal Forming Processes
- Inventor of NAGFORM / NAGSIM software
- PATENTS (Co-Inventors – Ford Motor Company) in the following subjects:
  - Extrusion forming of internal helical splines
  - Stepped extrusion die assembly
  - Cold extrusion for helical gear teeth
  - Entrance contour design to streamline metal flow in a forging die
- Over 40 publications in journals such as ASME, SME, ASM, Fastener Technology International etc.
- Taught Mechanical Engineering related classes at University of Michigan (Dearborn), Lawrence Tech University and University of Detroit Mercy.
- Work Experience
  - President, Metal Forming Systems, Inc.
  - Transmission Gear Development Consultant, Ford Motor Company
  - Principal Research Scientist, Battelle Labs, Columbus Ohio
  - Tool Engineer, Tata Engineering (TELCO), India