

Course Number: 28545
Course Name: METAL FORMING ANALYSIS

Course Type: Theory @ Applied
Prerequisite: Nothing.
Level: Graduate
Group: Applied Mechanic

Type & Max Unit: Constant 3
Corequisite: Nothing.
First Presentation: 1997-2
Last Edition: 2017-2.

Objectives:

The main purpose of this course is to present the basic principles and methodologies in estimation of some deformation parameters such as loads, stresses and strains resulted in metal forming processes. Some subjects of this course are based on the recent research and development projects conducted by the course instructor. Both bulk and sheet forming are included. However, sheet forming issues are addressed in more detail.

Topics:

- Review of Mechanical Behavior of Metals and Basic Formulations in Engineering Plasticity.
- Anisotropy and its Effects on Yield Functions and Flow Rules.
- Application of Circle Grids in Strain Measurement.
- Applications of Square and Triangular elements in Strain Computation.
- Experimental Forming Limit Diagram in Steel Sheet Forming.
- Numerical Methods in prediction of Forming Limit Diagram.
- Deep Drawing Analysis.
- Bending Analysis.
- Ideal Work.
- Slab Method.
- Upper Bound Method.
- Slip Lines Field.
- Computer simulations in Sheet Metal Forming.

Text: Methods and Mechanics of Metal Forming By : A. Assempour & S. N. Onlugh

References:

- 1- Engineering Plasticity By W. Johnson, P.B. Mellor
- 2- Deformation Processing By W.A. Backofen
- 3- Manufacturing Processes for Engineering Materials. By Serope Kalpakjian
- 4- Forming Technologies Training Manual.
- 5- Standard ASTM E 8M-95a; Standard Test Methods for Tension Testing of Metallic Materials.
- 6- Metals Handbook Ninth Edition Volume 14 Forming And Forging
- 7- Metal Forming Mechanics & Metalurgy By W.F. Hosford & R. M. Caddell
- 8- Metal Forming: Fundamental & Applications By Altan &, OH & Gegal