UNIT - I

Chapter 1: Mechanics of Sheet Metal Forming

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1-1 to 1-30

Syllabus: Theory of plasticity, yield criteria, work of plastic deformation, sheet metal forming, formability studies-conventional processes, effect of friction in forming operation, experimental techniques of evaluation of friction in metal forming, deep drawing, analysis (Numerical), surface defects identification and remedies, introduction to forming simulation, challenges in Forming.

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1.6	Challenges in Forming	1-15
1.7	Numericals on Deep Drawing	1-16
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Chapter 2: Special Forming Processes

2-1 to 2-43

Syllabus: HVF, HERF (Explosive Forming) techniques- super plastic forming techniques-Hydro forming-Stretch forming, Laser beam forming-principles and process parameters Advantages, limitations and applications of different forming processes. Orbital forging-Isothermal Hot and cold isostatic pressing-High speed extrusion, Water hammer forming, Incremental Sheet forming, Magnetic Pulse forming, Metal Spinning, Electro Hydraulic Forming, Micro forming

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2.3	High Energy Rate Forming Processes (HERF)	2-3



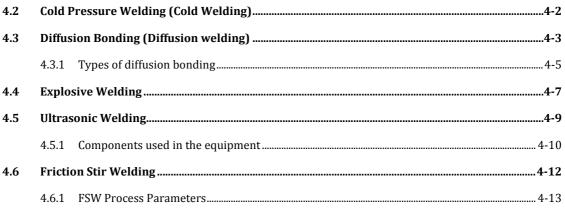
Syllabus: Weld thermal cycles and their effects, effects of pre and post weld heat treatments, concept of HAZ, concept of weldability and its assessment. Welding of dissimilar materials, Weld characterization, Weld decay and weld sensitization, Introduction to ASME, ASWE, IS Welding

Standards, (welding skill levels).

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wel	labus : Cold pressure welding, Diffusion bonding, Explosive welding, Ultrasoni ding, Forge welding, Roll welding and Hot pressure welding processes - itations and applications, Advances in adhesive bonding, cladding.	<u> </u>
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Syllabus : Electrogas, electroslag welding, Atomic hydrogen welding, Electron beam welding, Laser Beam welding - principle, working and applications, Cold Metal Transfer - concepts, processes and applications, Underwater welding, Welding automation in aerospace, nuclear and surface transport vehicles, Robotic Welding, Plasma Arc Welding, Plasma Transferred Arc Welding.

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UNIT - VI

Chapter 6: Sustainable Manufacturing

6-1 to 6-19

Syllabus: Sustainable Manufacturing: Introduction to sustainability and drivers for sustainable development and sustainable manufacturing, fundamentals of sustainable manufacturing, various tools, factors of sustainability, Principles of Life Cycle Assessment (Goal, Scope and Life Cycle Inventory), Approaches, Role in Industry 4.0, Green Manufacturing, Environment protection norms, ISO 14000, recycling techniques, safety norms in forming and welding, socio-economic aspects, case study on waste recycling, material recycling, etc

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