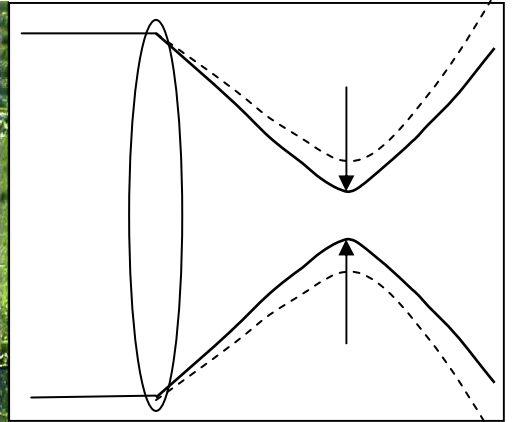
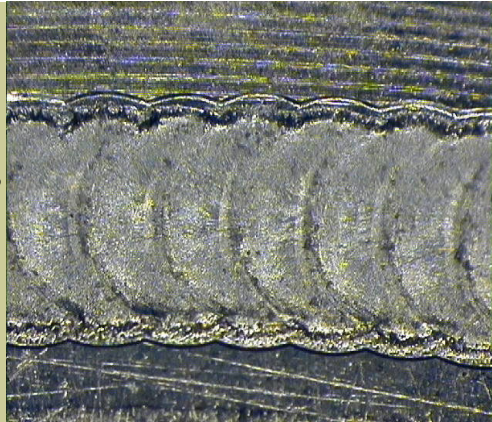


One-day Course

Lasers and Materials Processing

Course Contents

1. Light and Lasers
2. Laser Cavity
3. Beam Characteristics and Propagation
4. Types of Lasers
5. Laser-Material Interaction
6. Laser Safety
7. Laser Applications
 - **Welding**
 - **Cutting**
 - **Drilling**
 - **Marking**
 - **Hardening**
 - **Texturing**
 - **Trimming**
 - **Rapid Prototyping**



Lasers are increasingly finding applications for industrial materials processing including welding, cutting, drilling, marking, hardening, texturing, trimming, soldering, and rapid prototyping. Over the last two decades, a wide variety of laser technologies have matured and commercialized leaving the engineer with a bewildering array of choices. This one-day course is designed for engineers to get a broad understanding of laser technology. The first chapter introduces basic concepts and properties of ordinary light and LASER light. The second section describes the “insides” of a laser cavity. The third section deals with propagation of laser light, as it exits the laser cavity and ending with interaction with the material. The fourth section explains the physical phenomenon involved with interaction of laser with materials. Important physical properties of materials such as absorptivity, thermal conductivity, heat capacity are discussed in the context of laser-based materials processing. Laser safety is introduced with an understanding of how lasers react with the human body. Finally, we look at a variety of applications that are common in industrial manufacturing such as welding and cutting, and discuss a new applications such as texturing and micro-machining.

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