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المعهد الهندسي لخدمات التكنولوجيا والبرمجيات



Engineering office for Technology and Software Services

Advanced Welding Techniques



Technicians Training Program – Advanced Welding Techniques

Code: 28002W-TECH

Category: Technical Training – Welding & Metalwork

Introduction:

Advanced welding techniques are essential in modern industries where precision, strength, and speed are critical. This course introduces cutting-edge welding methods such as Plasma, Laser, and Electron Beam welding—

Main Branch: United building – E Shams –Front NBE
, El Siouf _Alexandria

Tel: 01102060500-01144470856



الفرع الرئيسي :عمارات المتحدة – عمارة عين شمس – امام البنك
الاهلي – السيوف- الاسكندرية

تليفون: 01102060500 - 01144470856

E-mail. adelramadan@eotss-academy.com
info@eotss-academy.com

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technologies used in aerospace, automotive, electronics, and heavy machinery production. Participants will also explore non-destructive testing methods to ensure the quality and reliability of their welds. The course blends theoretical knowledge with extensive hands-on practice to develop both understanding and technical proficiency.

Description:

This course is designed to equip participants with advanced welding techniques used in high-tech industries such as aerospace, automotive, and heavy equipment manufacturing. The course emphasizes modern welding technologies like Plasma, Laser, and Electron Beam welding, alongside professional testing and quality control methods.

Details of Modules:

- 1. Introduction to Advanced Techniques:**
 - Differences between traditional and advanced welding
 - Industrial applications of advanced welding
- 2. Plasma Welding:**
 - Working principles of plasma welding
 - Applications in thin and sensitive metal work
- 3. Laser & Electron Beam Welding:**
 - Features of laser welding (speed and precision)
 - Electron beam welding for thick metal components
- 4. Spot Welding:**
 - Principles of spot welding
 - Uses in electronics and automotive assembly
- 5. Welding Testing Techniques:**
 - Visual inspection
 - Ultrasonic testing methods
- 6. Practical Applications:**
 - Hands-on welding using plasma and laser systems
 - Quality testing and defect analysis of welds

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Objectives:

- Understand how advanced welding technologies function
- Apply welding techniques that meet modern industrial standards
- Inspect and verify weld quality using professional tools
- Improve precision and efficiency in complex welding tasks

Outcomes:

By the end of the course, participants will be able to:

- Perform advanced welding using plasma, laser, and electron beam methods
- Accurately identify and analyze welding defects
- Select suitable techniques for different materials and applications
- Interpret test results and apply corrective actions

Target Audience:

- Welders seeking to advance to expert-level skills
- Maintenance and production engineers in industrial sectors
- Graduates of industrial and technical institutes

Time Frame:

4 Weeks – 5 days per week × 4 hours/day

Total: 80 training hours (Theory + Practice)

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