



Project No.
2040

Date
2025

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EOTSS2040

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Mechanical

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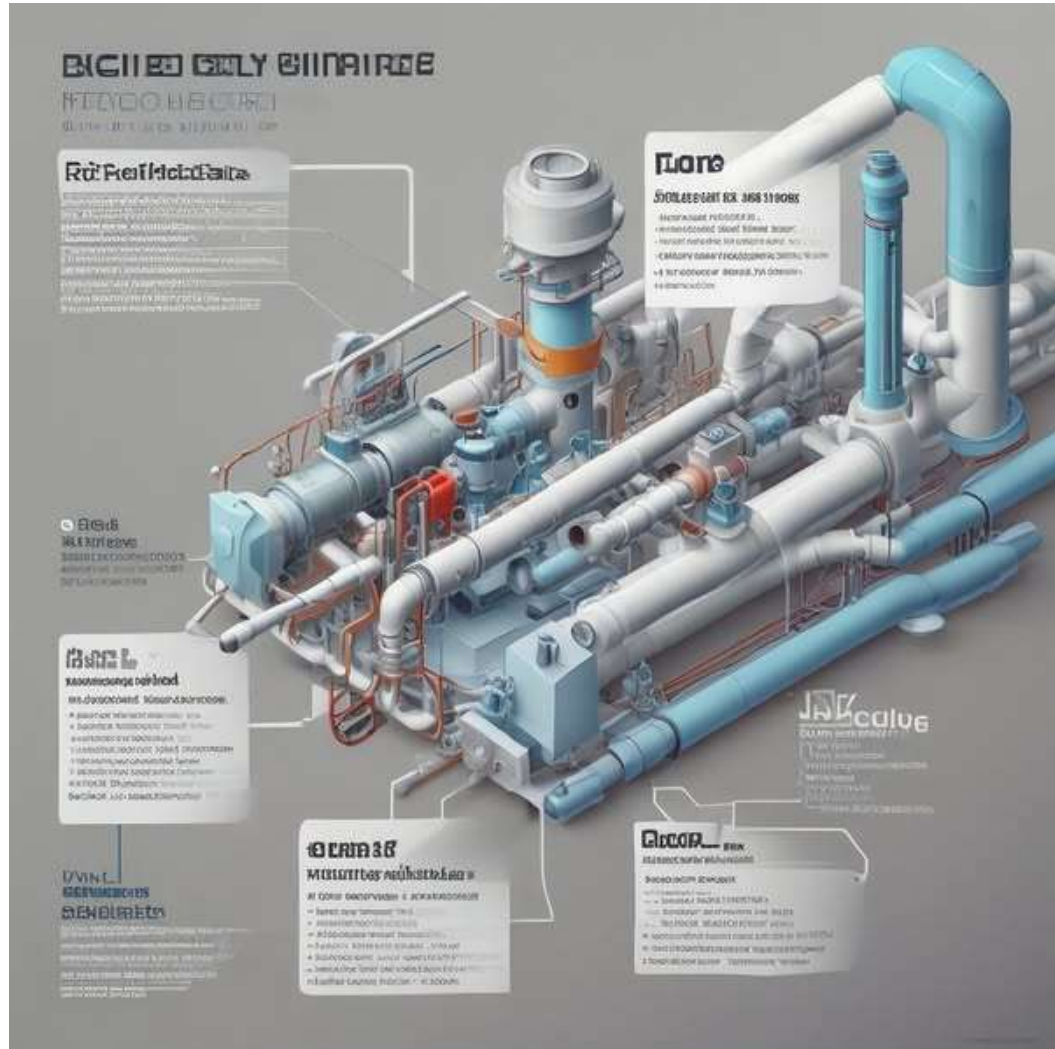
EOTSS/Mechanical/2040-MECH/2025



المكتب الهندسي لخدمات التكنولوجيا والبرمجيات

Engineering office for Technology and Software Services

Medical Gas Pipeline System (MGPS)



Course Code: 2040-MECH

Duration: 4 Weeks | 12 Sessions | 2 Hours per Session

Format: Practical & Theoretical | On-site / Online

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

Tel: 01102060500-01144470856



الفرع الرئيسي :عمارات المتحدة – عمارة عين شمس – امام البنك
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Introduction

This course provides a comprehensive understanding of the design, installation, operation, and maintenance of Medical Gas Pipeline Systems (MGPS) used in hospitals and healthcare facilities. It focuses on both technical and safety aspects aligned with international standards.

Description

Medical gas systems are critical in modern healthcare settings. Engineers and technicians working with MGPS must understand the different gas types, their sources, distribution systems, safety regulations, and maintenance procedures. This course offers hands-on insights and industry-recognized best practices for managing and maintaining these life-supporting systems.

Objectives

By the end of the course, participants will:

- Understand the components and functions of a medical gas pipeline system
- Identify and manage the different types of medical gases
- Learn international standards for design and installation (NFPA 99, HTM 02-01)
- Gain practical skills in system inspection, troubleshooting, and leak detection
- Ensure compliance with safety and legal requirements

Course Outline (Week-by-Week)

Week 1: Introduction & System Components

- What is an MGPS and why is it critical?
- Core components:
 - Gas sources: Cylinders, liquid tanks

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- Pressure regulation systems
- Terminal outlets and zone valves
- Types of gases:
 - Oxygen (O₂)
 - Nitrous Oxide (N₂O)
 - Medical Air
 - Vacuum (suction)

Week 2: System Design & Installation

- International codes: NFPA 99, HTM 02-01
- Designing for optimal pressure, flow, and safety
- Material selection: copper pipes, valves, fittings
- Security and risk considerations during installation

Week 3: Maintenance & Troubleshooting

- Preventive and scheduled maintenance
- Leak detection methods and repair techniques
- Gas purity tests and quality assurance
- Emergency fault handling procedures

Week 4: Safety & Regulatory Compliance

- Safety standards: OSHA, ISO 7396-1
- Fire and explosion risk prevention
- Emergency response training and evacuation
- Legal compliance and certification requirements

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Practical Activities

- Field visits to hospitals (optional)
- Workshops on system assembly and testing
- Leak detection exercises using real-world tools
- Hands-on pressure testing and system validation



What You Will Learn

- End-to-end operation of a medical gas pipeline system
- Installation techniques following global standards
- How to troubleshoot and perform leak tests
- Proper use of medical gas in critical environments
- Safety practices and legal obligations in MGPS operations



Target Audience

- Biomedical engineers
- Mechanical and electrical engineers
- Hospital maintenance technicians
- Health and safety officers in healthcare facilities



Materials Provided

- Training manual and design schematics

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- Access to digital simulation tools and worksheets
- Checklists for inspection and maintenance
- Certification preparation guide



Instruction Methods

- Interactive lectures with visual aids
- Real-life case studies and hospital scenarios
- Hands-on workshops and group exercises
- Simulation-based learning for fault detection



Time Frame

- **Total Duration:** 24 hours
- **Schedule:** 4 weeks
- **Sessions:** 3 sessions/week, 2 hours/session



Learning Outcomes

Upon completion, participants will be able to:

- ✓ Design and interpret MGPS layout diagrams
- ✓ Conduct proper installation procedures
- ✓ Perform periodic maintenance and gas quality checks
- ✓ Detect faults and respond to emergencies
- ✓ Comply with international safety and medical standards



Certification

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Participants will receive an **Accredited Certificate in Medical Gas Pipeline Systems (MGPS)** upon successful course completion and evaluation.

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