| Project No. | Date | Doc. No. | Serial No | Rev. | Proj. dep. |
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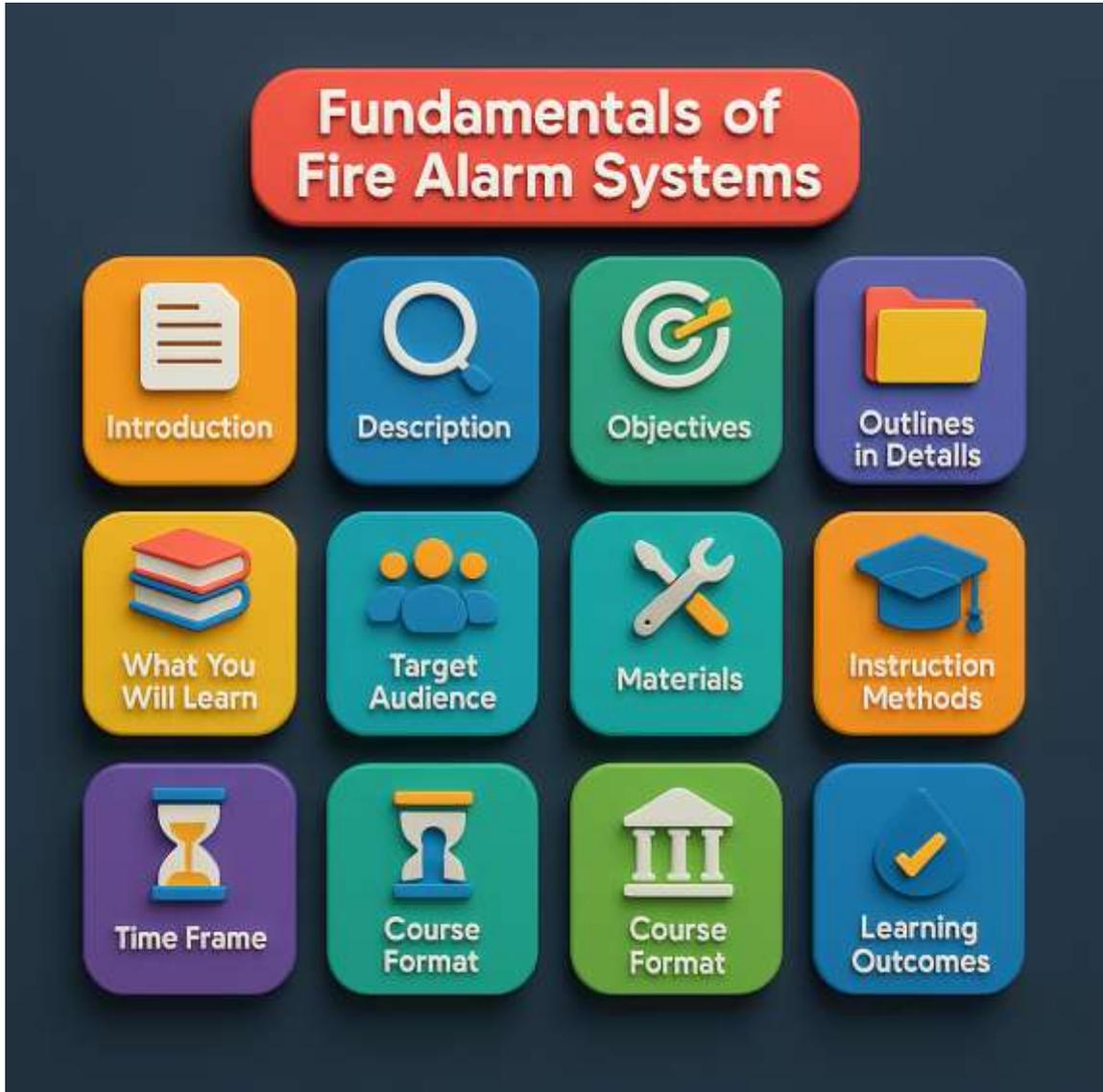*EOTSS Doc. CODE* :     ***EOTSS/Mechanical/2075-MECH/2025***

المكتب الهندسي لخدمات التكنولوجيا و البرمجيات

**Engineering office for Technology and Software Services**

# Fundamentals of Fire Alarm Systems



## Code: 2075-MECH

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

Fire alarm systems are a fundamental aspect of modern building safety, providing early warning to occupants in the event of fire and facilitating rapid evacuation. This course introduces the essential principles, components, design, installation, and maintenance of fire alarm systems, emphasizing compliance with international standards.

## 🔎 Description

This course examines the key elements and operation of fire alarm systems, including detection technologies, control panels, signaling devices, integration with building management systems, and system testing protocols. Emphasis is placed on system design in accordance with codes and best practices.

## 🎯 Objectives

- To provide a thorough understanding of fire alarm system functions and classifications

- To develop the ability to design, install, and maintain fire alarm systems

- To familiarize participants with detection technologies and alarm notification strategies

- To ensure knowledge of standards, inspection, and testing procedures

## 📋 Outlines in Details

1. **Principles of Fire Alarm Systems**

   o Importance in life safety

   o Regulatory and code requirements (NFPA 72, EN 54, etc.)

2. **System Components**

   o Fire detectors: smoke, heat, flame, multi-sensor

   o Manual call points

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- o   Control and indicating equipment

- o   Power supplies and battery backup

3.  **Notification Appliances**

- o   Audible and visual alarms

- o   Voice evacuation systems

- o   Integration with building systems (e.g., elevators, HVAC, sprinklers)

4.  **System Design and Planning**

- o   System classification: conventional, addressable, wireless

- o   Device placement and zoning

- o   Wiring and network architecture

5.  **Installation and Commissioning**

- o   Standards for installation

- o   Testing, inspection, and commissioning procedures

6.  **Maintenance and Troubleshooting**

- o   Routine checks and maintenance schedules

- o   Fault diagnosis and rectification

7.  **Emerging Technologies**

- o   Intelligent fire detection

- o   Networked alarm systems

- o   Integration with IoT and smart buildings

## 📚 **What You Will Learn**

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- Types and operation of fire detectors and alarm systems

- Principles of alarm notification and system integration

- Best practices in design, installation, and commissioning

- Procedures for inspection, maintenance, and troubleshooting

- Application of regulatory codes and standards

## 👥 Target Audience

- Fire alarm engineers and technicians

- Safety managers and facility engineers

- Architects and building services professionals

- Fire inspectors and code enforcement officers

- Engineering students specializing in safety or building systems

## 🛠️ Materials

- Illustrated course handbook

- System diagrams and device datasheets

- Practice exercises and case studies

- Access to simulation/training software

## 👨‍🏫 Instruction Methods

- Lectures and presentations

- Hands-on installation workshops

- Demonstrations and system simulations

- Group discussions and assessments

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## ⏳ Time Frame

- Duration: 16 hours (4 sessions, 4 hours each)

## 🏛 Course Format

- In-person or blended (online + practical)

- Modular structure for flexibility

- Continuous assessment and certification

## 🎓 Learning Outcomes

Upon completion, participants will:

- Understand the structure and operation of fire alarm systems

- Apply best practices in design, installation, and maintenance

- Demonstrate compliance with international codes and standards

- Perform system testing, troubleshooting, and reporting

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