Human Factors Engineering for Industrial Safety Training Course



23 - 27 Nov 2026

Boston

7500 € (Per Person)

Ref: #HSE7548_108257

Course Introduction / Overview:

This course provides a comprehensive exploration of Human Factors Engineering (HFE), a critical discipline for creating safer, more productive, and more reliable industrial environments. It moves beyond traditional safety paradigms that often focus on individual blame, instead adopting a systemic approach to understand how human capabilities and limitations interact with technology, procedures, and the work environment. As pioneering safety scientist Sidney Dekker argues in his influential work, "The Field Guide to Understanding 'Human Error'," mistakes are not the cause of failure but rather a symptom of deeper systemic issues. This training course, offered by BIG BEN Training Center, is designed to equip professionals with the knowledge and tools to identify and mitigate these systemic vulnerabilities before they lead to accidents. Participants will delve into cognitive and physical ergonomics, human performance limitations, and the psychology of error. The curriculum is structured to build a proactive safety culture by integrating human-centered design principles into every facet of operations, from equipment design and procedure writing to incident investigation and safety management systems. This program empowers attendees to become agents of change, capable of engineering resilient systems that anticipate and accommodate human variability, thereby preventing accidents and enhancing overall operational excellence.

Target Audience / This training course is suitable for:

- Health, Safety, and Environment (HSE) Managers and Professionals.
- Operations and Production Supervisors.
- Industrial and Systems Engineers.
- Plant and Facility Managers.
- Maintenance and Reliability Engineers.
- Risk Management Consultants.
- Incident Investigators and Accident Analysts.
- Quality Assurance and Control Specialists.
- Human Resources and Training Managers.
- Regulatory Compliance Officers.

Target Sectors and Industries:

- Manufacturing and Production.
- Oil and Gas Exploration and Refining.
- Construction and Civil Engineering.
- Aviation and Aerospace.
- Chemical and Process Industries.
- Energy, Power Generation, and Utilities.
- Transportation and Logistics.
- Healthcare and Pharmaceuticals.
- Governmental bodies and regulatory agencies.
- Mining and Heavy Industry.

Target Organizations Departments:

- Health, Safety, and Environment (HSE).
- Operations Management.
- Engineering and Design.
- Maintenance and Asset Management.
- Quality Assurance (QA) and Quality Control (QC).
- Human Resources and Training.
- Risk Management and Compliance.
- Project Management.
- Research and Development (R&D).

Course Offerings:

By the end of this course, the participants will have able to:

- Analyze the fundamental principles of human factors engineering and their application in industrial safety.
- Identify the cognitive and psychological factors that influence human performance and error in the workplace.
- Apply ergonomic principles to the design of workstations, tools, and tasks to reduce physical strain and risk.
- Conduct systematic incident investigations that focus on identifying systemic failures rather than individual blame.
- Utilize human error identification and analysis techniques to proactively assess and mitigate risks.
- Evaluate the effectiveness of human-machine interfaces (HMI) and control systems.
- Develop strategies to foster a positive and proactive safety culture within an organization.
- Integrate human factors considerations into the design and implementation of Safety Management Systems (SMS).
- Assess the impact of organizational factors, such as communication and procedures, on safety performance.
- Create and implement effective fatigue risk management programs.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, engaging, and practical, ensuring that participants can directly apply the learned concepts to their professional roles. We move beyond traditional lecture-based formats to create a dynamic learning environment. The course heavily relies on the analysis of real-world case studies from various industries, allowing participants to deconstruct major industrial accidents and understand the critical role human factors played in their causation. A significant portion of the training is dedicated to collaborative group workshops and problem-solving exercises where attendees work in teams to tackle realistic safety challenges, such as redesigning a work process or conducting a mock incident investigation. Interactive discussions, role-playing scenarios, and video analysis are used to explore complex topics like cognitive bias, situational awareness, and communication breakdowns. Participants will receive continuous feedback from the instructor and peers, fostering a supportive environment for skill development. This hands-on, application-focused approach ensures a deep and lasting understanding of human factors engineering principles.

Course Agenda (Course Units):

Unit One: Fundamentals of Human Factors and Industrial Safety

- Introduction to Human Factors Engineering (HFE).
- The history and evolution of safety science.
- Understanding the difference between human error and system failure.
- Models of accident causation (e.g., Swiss Cheese Model).
- The SHELL model for analyzing human-system interactions.
- The business case for integrating human factors into safety management.
- Legal and regulatory frameworks related to human factors.

Unit Two: Cognitive Ergonomics and Human Performance

- The psychology of human error and cognitive biases.
- Information processing, attention, and perception.
- Memory, decision-making, and problem-solving under pressure.
- Situational awareness and its importance in high-risk environments.
- The impact of stress, workload, and fatigue on performance.
- Designing effective warnings, alarms, and procedures.
- Strategies for managing cognitive load and preventing mental errors.

Unit Three: Physical Ergonomics and Workplace Design

- Principles of anthropometry and biomechanics in workplace design.
- Designing workstations to prevent musculoskeletal disorders (MSDs).
- Manual handling risk assessment and control measures.
- Design and layout of controls and displays for optimal usability.
- Environmental factors: lighting, noise, and thermal comfort.
- Human-computer interaction (HCI) and interface design.
- Applying ergonomic principles to tool and equipment selection.

Unit Four: Error Analysis and Incident Investigation

- Proactive vs. reactive safety approaches.
- Techniques for Human Error Identification (HEI).
- Introduction to Human Reliability Analysis (HRA).
- Root Cause Analysis (RCA) from a human factor's perspective.
- Conducting effective witness interviews and data gathering.
- Analyzing contributing factors: organizational, environmental, and job-related.
- Developing effective recommendations to prevent recurrence.

Unit Five: Proactive Safety Management and Organizational Culture

- The role of leadership in shaping safety culture.
- Assessing and improving an organization's safety culture.
- Integrating human factors into Safety Management Systems (SMS).
- Principles of human-centered design in engineering projects.
- Managing the human factors of automation and new technology.
- Developing and implementing a Fatigue Risk Management System (FRMS).
- Measuring safety performance with leading and lagging indicators.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

If human error is a symptom of a deeper systemic failure, how can organizations shift their focus from blaming individuals to redesigning the system itself?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by fundamentally reframing the concept of industrial safety, moving beyond compliance-based checklists to a deeply integrated, systemic approach. Unlike programs that may treat human error as a root cause, this training teaches participants to view it as a symptom of poorly designed systems, processes, and organizational cultures. We emphasize a proactive, design-oriented philosophy, equipping attendees with the tools to engineer safety into their operations from the ground up, rather than simply reacting to incidents after they occur. The curriculum is built upon a robust academic foundation, incorporating principles from cognitive psychology, engineering, and organizational science to provide a holistic understanding of human performance. A key differentiator is our heavy reliance on in-depth case study analysis of major industrial events, which provides powerful, real-world context for theoretical concepts. Participants will not just learn what human factors are; they will learn how to think like a human factors specialist, enabling them to identify latent risks and design resilient systems that are forgiving of human fallibility, ultimately fostering a more robust and sustainable safety culture.