Training Course on General Mechanical Codes, Standards and Specifications

Professional Development Training Course Outline

Category	Engineering	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Understanding and applying mechanical codes, standards, and specifications is essential for ensuring safety, quality, compliance, and operational efficiency in mechanical engineering and industrial practices. Training Course on General Mechanical Codes, Standards & Specifications equips professionals with cutting-edge knowledge of international and regional mechanical codes, including ASME, ANSI, API, ASTM, ISO, and others. By diving into real-world case studies and technical applications, participants will gain practical skills to interpret, apply, and manage mechanical standards across diverse industries, from manufacturing to energy and infrastructure.

As mechanical systems evolve with advancements in materials, automation, and sustainability, staying updated on regulatory compliance and technical specifications is more critical than ever. This course leverages industry-driven scenarios, interactive learning techniques, and performance-based assessments to help learners master the critical concepts of design validation, inspection, quality control, and project documentation in accordance with global mechanical codes and specifications.

Programme Curriculum

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Course Objectives

1. Understand the core principles of mechanical codes (ASME, API, ANSI, ISO).
2. Interpret and apply engineering standards for piping and pressure vessels.
3. Implement compliance strategies in mechanical system design.
4. Analyze case studies of code violations and corrective measures.
5. Evaluate the impact of material standards and specifications on performance.
6. Apply risk-based inspection (RBI) methodologies using current standards.
7. Understand the role of quality assurance and documentation control.
8. Develop skills in mechanical system auditing and reporting.
9. Stay updated with latest trends in mechanical compliance and regulations.
10. Compare international vs local mechanical engineering practices.
11. Master welding procedures and NDT standards.
12. Integrate environmental and sustainability codes in mechanical systems.
13. Utilize digital tools and BIM in mechanical code compliance.

Target Audience

1. Mechanical Engineers
2. Project Managers
3. Design Engineers
4. Quality Assurance Professionals
5. Plant Maintenance Engineers
6. Construction Supervisors
7. Code Inspectors
8. Compliance & Safety Officers

Course Duration: 10 days

Course Modules

Module 1: Introduction to Mechanical Codes & Standards

- History and evolution of codes
- Code vs standard vs specification

- Global standardization bodies (ASME, API, ISO)
- Importance of compliance
- Overview of legal and regulatory frameworks
- **Case Study:** Code Failure in HVAC System – Lessons Learned

Module 2: ASME Boiler and Pressure Vessel Code (BPVC)

- Section I and Section VIII overview
- Pressure testing and certification
- Design and fabrication requirements
- Material specifications and limitations
- Common pitfalls in ASME applications
- **Case Study:** Pressure Vessel Failure in Refinery

Module 3: API Standards and Oil & Gas Applications

- API 650 and 653 for storage tanks
- API 570 for piping systems
- Inspection and maintenance guidelines
- Role of API in safety and design
- Digital monitoring integration
- **Case Study:** API 653 Tank Compliance Review

Module 4: Piping Design and Engineering Standards

- Pipe class and rating
- Layout, stress analysis, and supports
- ANSI, ASME B31 series
- Flexibility and expansion considerations
- Pipe failure modes
- **Case Study:** Piping Collapse in Offshore Rig

Module 5: Welding Codes and NDT Requirements

- ASME Section IX – Welding qualifications
- NDT methods (UT, RT, PT, MT)
- Welder qualification and procedures
- Welding defects and inspections
- NDT standards (ISO, ASME, AWS)
- **Case Study:** Weld Failure in Structural Piping

Module 6: Material Standards and Selection

- ASTM and ISO material classifications
- Selection criteria: temperature, corrosion, pressure
- Traceability and certification
- Material compatibility in systems

- Specification review processes
- **Case Study:** Incorrect Alloy Selection in Heat Exchanger

Module 7: Quality Assurance and Documentation

- QA/QC procedures in mechanical systems
- Document control and traceability
- Code documentation requirements
- Audit trail and records management
- Inspection test plans (ITP)
- **Case Study:** Audit Failure Due to Poor Recordkeeping

Module 8: Risk-Based Inspection (RBI)

- RBI methodology and API 580
- Prioritization of inspection intervals
- Damage mechanisms and risk ranking
- RBI software tools
- Integration with maintenance programs
  Case Study: RBI Optimization in Petrochemical Plant

Module 9: Mechanical System Auditing

- Audit types: internal, third-party
- Checklists and code-based benchmarks
- Performance audits and documentation
- Root cause analysis techniques
- Audit reporting tools
- **Case Study:** Mechanical Code Audit in Manufacturing Plant

Module 10: Sustainability and Environmental Codes

- LEED and green mechanical systems
- ISO 14001 integration
- Sustainable material selection
- Energy efficiency standards
- Lifecycle assessment techniques
- **Case Study:** Green Building Compliance – HVAC System Audit

Module 11: Fire Safety and HVAC Standards

- NFPA codes for mechanical systems
- HVAC compliance with ASHRAE
- Ventilation and smoke control systems
- Fire dampers and thermal protection
- Code-based emergency response features
- **Case Study:** HVAC Fire Event and Code Deficiency Review

Module 12: Industrial Equipment Code Compliance

- Rotating and static equipment codes
- Code specifications for pumps, compressors
- Equipment testing and commissioning
- Manufacturer’s compliance declaration
- Case-specific equipment inspections
- **Case Study:** Compressor Failure Due to Spec Violation

Module 13: International vs Local Code Application

- Regional adaptations of ISO/ASME/API
- Local jurisdiction approvals
- Cross-border engineering challenges
- Harmonization and discrepancies
- International procurement code considerations
- **Case Study:** Offshore Platform Discrepancy in Code Compliance

Module 14: Digital Tools for Code Management

- CAD and BIM integration with codes
- Cloud-based documentation
- Compliance tracking software
- QR coding and digital inspection
- Smart checklists for field compliance
- **Case Study:** BIM Model Audit for Mechanical Room

Module 15: Capstone Case Study and Final Assessment

- Comprehensive real-world code application
- Group discussion and solution analysis
- Presentation of findings
- Code-based decision-making process
- Final assessment and certification
- **Case Study:** Complete Mechanical System Review of New Facility

Training Methodology

- Instructor-led sessions (virtual/live)
- Real-world case studies and industry benchmarks
- Interactive quizzes and code interpretation tasks
- Group-based problem-solving activities
- Downloadable technical resources and templates
- BIM/modeling demonstrations for code application
- Post-course evaluation and knowledge assessment

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com