



Technical University
of Leoben



DEPARTMENT
GEO ENERGY

Pipeline Engineering Programme

Module MC02: Pipeline Materials and Mechanical Design



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Key Facts

- ✓ **Duration:** 2 weeks
- ✓ **Format:** In-person & online (Leoben, Austria)
- ✓ **Language:** English
- ✓ **Certificate:** Micro-Credential (ECTS transferable)
- ✓ **Prerequisites:** Technical background in fluid mechanics or engineering recommended; none required

Key Learning Outcomes

1. Evaluate pipeline materials for mechanical, environmental, and economic suitability.
2. Describe manufacturing methods and their influence on pipeline performance.
3. Determine design pressure, wall thickness, and Maximum Allowable Operating Pressure using industry standards.
4. Analyse key pipeline loads and stress conditions.
5. Explain corrosion mechanisms affecting pipeline integrity.
6. Select appropriate corrosion protection, inspection, and monitoring methods.

Module Overview

This module provides a solid foundation for selecting, designing, and protecting pipeline systems, with focus on materials, manufacturing methods, structural design, and corrosion prevention. Participants explore key material properties and manufacturing processes, and the course covers essential structural design concepts such as design pressure, wall thickness, and Maximum Allowable Operating Pressure in line with international standards. It also introduces corrosion mechanisms and the corresponding protection, inspection, and monitoring practices, equipping participants with the knowledge and skills needed to support safe and reliable pipeline systems in diverse environments.

Course Outline

1. **Pipeline Materials:** Steel, plastic, concrete, and composite materials with key selection criteria for strength, durability, corrosion resistance, and cost.
2. **Pipe Manufacturing:** Main steel manufacturing methods, plastic and concrete production techniques, and essential quality control steps.
3. **Structural Design:** Design pressure, Maximum Allowable Operating Pressure, wall thickness calculation, and basic load and stress analysis.
4. **Corrosion Protection:** Corrosion mechanisms, coatings, cathodic protection, inhibitors, and key inspection and monitoring methods.

Instructors



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