

### Radiography testing

Properties of ionizing radiation. X ray producing devices for industrial radiography. Principles of radiography techniques. Film radiography. Digital radiography basics. Exposure calculations. Quality control of radiography images. Interpretation of radiography images with emphasis on weldings images. Principles of computed tomography. Radiation protection basics. Quality standards and quality control. Radiography Laboratory work in four parts: 1) Film development. 2) Radiography of a standard step wedge specimen - measurement of optical density. 3) Radiography of weldings. 4) Radiography of a random specimen.

### Ultrasound testing

Elements of ultrasound theory (wave propagation in elastic solid media - wave propagation properties at free boundaries and interfaces - critical propagation angles). Locating defects using ultrasound (ultrasound testing theory, ultrasound equipment, piezoelectric transducers, phased array ultrasonics, attenuation, scattering, dispersion, ultrasound testing set ups, assessments of detectable defects with focus on crack detection). Ultrasound Laboratory in one part: thickness measurements and locating of defects in weldings.