

OE5570: REHABILITATION AND RETROFITTING OF MARINE STRUCTURES

Course Content:

Deterioration process; corrosion of embedded steel in concrete structures; Chloride induced corrosion; Carbonation induced corrosion; Crack induced corrosion; Chemical seawater attack; Cracking and spalling of concrete; Cover assessment; Condition assessment; Non-destructive testing of marine structures; Core testing; UPV tests; high strain and low strain tests; impact. Assessment of concrete strength using tests; Preventive maintenance and repairs; Pull tests and natural frequency analysis; Analysis of degraded structure for strength and durability; Probability analysis of concrete strength; Control of chloride ingress; Surface coatings; Design life extension analysis; Life cycle costing (LCC); Repair of beams and slab using spray mortar; Patch repairs; injection grouting; jacketing techniques; Cathodic protection of reinforcement; Under water inspection and repair techniques for RC piles; removal of marine growth; grouted clamps; Underwater grouting techniques; Polymer concrete surfacing and composite jacketing.

Text Books:

1. **Ben C. Gerwick Jr.** 2007. Construction of Marine and Offshore Structures, CRC Press, USA, ISBN: 978-042-91-2502-7
2. **Carl A. Thoresen.** 1988. Port design: Guidelines and recommendations, Tapir, University of California, ISBN: 9788251908399
3. **Gaythwaite, JW.** 1990. Design of marine facilities for berthing, mooring and repair of vessels, Van Nostrand Reinhold, USA, ISBN: 978-0784407264.

Reference Books:

1. **PIANC Report No. 162**, 2016, Recommendations for increased durability service life of new marine concrete infrastructure.

Prerequisite: