SECTION B: WAVES

1. LINEAR WAVE THEORY
- 1.1 Main wave parameters
- 1.2 Dispersion relationship
- 1.3 Wave velocity and pressure
- 1.4 Wave energy
- 1.5 Group velocity
- 1.6 Energy transfer (wave power)
- 1.7 Particle motion
- 1.8 Shallow-water and deep-water behaviour
- 1.9 Waves on currents

2. WAVE TRANSFORMATION
- 2.1 Refraction
- 2.2 Shoaling
- 2.3 Breaking
- 2.4 Diffraction
- 2.5 Reflection

3. RANDOM WAVES AND STATISTICS
- 3.1 Measures of wave height and period
- 3.2 Probability distribution of wave heights
- 3.3 Wave spectra
- 3.4 Reconstructing a wave field
- 3.5 Prediction of wave climate

4. WAVE LOADING ON STRUCTURES
- 4.1 Pressure distribution
- 4.2 Surface-piercing structure
- 4.3 Fully-submerged structure
- 4.4 Loads on a vertical (caisson-type) breakwater

APPENDIX: MATHEMATICAL DERIVATIONS
- A1 Hyperbolic functions
- A2 Fluid-flow equations
- A3 Derivation of wave field and dispersion equation
- A4 Wave kinetic and potential energy
- A5 Group velocity
- A6 Wave power

Recommended Textbooks

Dean, R.G. and Dalrymple, R.A., 1992, *Water Wave Mechanics For Engineers and Scientists*, World Scientific, ISBN 978-9810204211

Kamphuis, J.W., 2019, *Introduction to coastal engineering and management*, 3rd Edition, World Scientific, ISBN 978-9811208980