

Syllabus: SIO 241 Advanced Signal Processing

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Course Description

Review basic fluid and elastic wave propagation in infinite and finite media. Introduce signal and array -processing methods for localization, medium inversion, and non -destructive testing based on the underwater, seismic, and radar literature.

Topics

1. Background acoustics of simple structures for processing 'platform':
 - (a) Plane Wave
 - (b) Waveguide
 - (c) Finite Bar
2. Basic Array Processing
 - (a) Linear Beamforming
 - (b) Minimum Variance and White Noise Constraint
 - (c) Eigenvector techniques, e.g., "MUSIC", Null Space Projections ...
3. Inversion, :Linear, nonlinear, sensitivity kernel
4. Correlation based noise processing
 - (a) Simulation of Noise Fields
 - (b) Noised Based Inversion