

Syllabus: SIO 209 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 vibration/acoustics of simple structures for processing 'platform':
 - (a) String
 - (b) Membrane
 - (c) Rod
 - (d) Plate
2. Basic Array Processing
 - (a) Linear Beamforming
 - (b) Minimum Variance and White Noise Constraint
 - (c) Eigenvector techniques, *e.g.*, "MUSIC", Null Space Projections ...
 - (d) Inversion, :Linear, nonlinear
3. External coupling: Radiation
4. Noise Correlation based processing