Sound Propagation Through Media - Web course

COURSE OUTLINE

The course is split in seven modules. These cover the following areas.

Module 1: Introduction & Concept Review
Module 2: Wave Propagation in Solids and Fluids
Module 3: Acoustic Waves in Homogenous Fluids
Module 4: Acoustic Waves in Non-Homogenous Fluids
Module 5: Waveguides
Module 6: Transmission Through Walls
Module 7: Radial Propagation and Directivity

COURSE DETAIL

<table>
<thead>
<tr>
<th>Module No.</th>
<th>Title</th>
<th>Lectures</th>
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| 01.        | Introduction and Concept Review | 1. Introduction, waves, sound, acoustics, nature of sound, application areas of sound  
             |                                | 2. Terminology: Octave, decade, wave number, bandwidth, tones, noise  
             |                                | 3. Decibel, sound power level, sound intensity level, sound pressure level  
             |                                | 4. Adding decibels for correlated and uncorrelated signals  
             |                                | 5. Complex time signals, transfer functions, poles and zeros, plots for poles and zeros  
             |                                | 6. Bode plots - magnitude plots for simple poles, and simple zeros  
             |                                | 7. Bode plots - phase plots for simple poles, and simple zeros  |
| 02.        | 1-D Waves in Fluids and Solids | 8. 1-D wave equation  
             |                                | 9. 1-D wave equation  
             |                                | 10. 1-D wave equation  
             |                                | 11. Waves in liquid media  
             |                                | 12. Waves in solid media  
             |                                | 13. Waves in solid media  
             |                                | 14. Waves in solids, dispersion, group velocity, phase velocity  |
| 03.        |                                |                                                                          |
21. Acoustic waves in non-homogenous media  
22. Ray paths  
23. Transmission through two fluid media - normal incidence  
24. Transmission through two fluid media - oblique incidence  
25. Transmission through two fluid media - oblique incidence  
26. Transmission through two fluid media - oblique incidence  
27. Transmission through two fluid media - oblique incidence |
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| 05. | Waveguides | 28. Waveguides, transmission line equations  
29. 1-D Waves: examples, standing waves, notion of impedance  
30. 1-D wave: Open tubes, imedance  
31. 1-D waves: Tubes with imperfect termination  
32. Kundt's apparatus |
| 06. | Sound Transmission through Walls | 33. Sound transmission through walls: normal incidence  
34. Sound transmission through walls: oblique incidence  
35. Three media problem |
| 07. | Radial Propagation & Directivity | 36. Radial propagation of sound, monopoles, and dipoles  
37. Radial propagation of sound, monopoles, and dipoles  
38. Radial propagation of sound, monopoles, and dipoles  
39. Directivity  
40. Summary |

**References:**