

Mathematical formulation of acoustic and dynamic physical problems: Analytic methods, asymptotic methods, approximations theory. Linear problems analysis: a) elliptic problems (integral equations, boundary element methods, variational methods and finite element methods). Applications to the aerodynamic (dynamic flows, Stokes flows, least squares method, penalty method, dual variational formulations b) Unsteady problems: the diffusion equation, the wave equation. Finite difference method, finite element method, vortex method. Analytical methods: Smooth and eigenvalue asymptotic problems. Applications to the flow around airfoils and wings. To attend this course, sufficient knowledge of the material of the following courses is strongly recommended: Fluid Mechanics I, Dynamics and Vibrations.