MECH 6372 Turbulent Flows (3 semester credit hours) In the first part of the course the governing equations will be reviewed. The vorticity equation will be derived giving emphasis to the vortex stretching and vortex tilting. Classical flows such as wall bounded flows, jets, mixing layers will be reviewed and the stability of the flow and transition from laminar to turbulence will be discussed. The spectrum of turbulence kinetic energy and the budget of kinetic energy will be illustrated. The course will also cover numerical methods to simulate turbulence, including Direct Numerical Simulations (DNS), Large Eddy Simulations (LES), and Reynolds-Average Navier-Stokes (RANS) equations and models. (3-0) R