RNA Silencing, also known as RNA interference (RNAi), is an evolutionarily conserved, sequence homology-based regulatory mechanism operating in nearly all eukaryotes. Starting with an introduction on the historical background, this course will cover our current understanding on the biogenesis and function of microRNA (miRNA) and other classes of endogenous small RNAs in a variety of eukaryotic model systems. Through lectures, presentations and class discussions on the milestone works, this course will expose graduate and upper division undergraduate students to the cutting-edge development in this exciting and fast-moving frontier of molecular & cell biology. Students with an interest in cell biology, molecular biology, biochemistry, genetics, and other related areas are all welcome to take this opportunity.