

**CE665A: Ecological and Biological Principles****3-0-0-0 [9]****Course Contents:**

Ecosystems; biotic and abiotic components; production and consumption; trophic levels; productivity and energy flow; food webs; cycling of elements; Ecology of population; ecological niche; mortality and survivorship; community interactions; Changes in ecosystems; succession; long range changes, long range stability; The organization and dynamics of ecological communities. Description and study of typical natural and artificial ecosystems; Biochemistry; photosynthesis and respiration, important biological compounds, enzymes; Microbiological concepts; cells, classification and characteristics of living organisms, characterization techniques, reproduction, metabolism, microbial growth kinetics; Applications to environmental engineering; assimilation of wastes, engineered systems, concepts and principles of carbon oxidation , nitrification, denitrification, methanogenesis, etc.