

**Course Code** : ENCM 21533  
**Title** : Applied Ecology  
**Pre-requisite** : ZOOL 12523  
**Co-requisite** : ENCM 21542  
**Status** : Compulsory, Theory

**Learning outcomes:**

After completion of the course unit, the student will be able to;

- explain the basic structure and functioning of an ecosystem,
- explain the principles related to the structure and functioning of populations,
- discuss the dynamics of the global human population,
- explain the factors affecting community composition,
- discuss the global climate patterns and distribution of biomes, and
- discuss the ecological concepts related to the structure and functioning of terrestrial and aquatic ecosystems.

**Course content:**

Basic structure and functioning of an ecosystem including energy flow, nutrient cycling and ecosystem productivity, Population ecology; Population size, Density and patterns of population dispersion, Demography including life tables, Survivorship curves and Reproductive rates, Exponential, geometric and logistic models of population growth, Utilization of patchy resources, Opportunistic organisms and life history patterns including r-selection and K-selection, Factors affecting population growth, Mechanisms of density independent and density dependent population regulation, Population dynamics including stability and functions and population cycles, The global human population, Community ecology; Community composition, Diversity indices, Species area relationships, Ecotones, Keystone and Flagship species, Concept of habitat and niche, Effect of environmental factors on biota, Concepts in stream/river ecology including Longitudinal zonation, River continuum concept, Flood-pulse concept and Serial discontinuity concept, Global climate patterns and climate change, Terrestrial and aquatic biomes, Structure and functioning of terrestrial, freshwater, brackish water, and marine ecosystems. Life Tables and key factor analysis.

**Method of teaching and learning:**

A combination of lectures, computer based learning, self-studies, assignments and small group discussions.

**Assessment:**

In-course assessment and end of semester examination.

**Recommended reading:**

1. Begon M., C. R. Townsend & J. L. Harper (2005). Ecology; from individuals to ecosystems. 4th Edition, Wiley-Blackwell.
2. Day, J. W., W. M. Kemp, Alejandro Yanez-Arancibia & B. C. Crump (2012). Estuarine Ecology, 2nd Edition, Wiley-Blackwell.
3. Dobson, M. & C. Frid (2008). Ecology of Aquatic Systems. 2nd edition, Oxford University Press.
4. Osborne, P. L. (2000). Tropical Ecosystems and Ecological Concepts. Cambridge University Press.
5. Raven, P. H. & G. B. Johnson (2010). Biology. 8th Edition. Tata McGraw-Hill Edition.
6. Reece, J. B., L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky & R. B. Jackson (2011). Biology - Campbell, 9th Edition. Pearson Education Inc.
7. Tait, R.V. & F. A. Dipper (2000). Elements of marine ecology. Butterworth-Heinemann, Oxford.