

## OPEN ELECTIVE COURSES

### BSE461 BIODIVERSITY

#### Unit I (13 hours)

Basic concepts and definitions, scope, biosphere, habitats, food chain, food web. Levels of biodiversity organizations – Genetic diversity, Species diversity and Ecosystem diversity. Indian ecological/geographical diversity: Himalayan Region, Deserts, Semiarid region, Gangetic plains, Western Ghats, Coastal region; Hotspots of biodiversity,

Microbial diversity : Bacteria, Cyanobacteria, Fungi and Lichens, Algae, Protozoa and viruses, habitat. Mushrooms – edible and nonedible. Plant and animal association with microbes. Beneficial and harmful microbes, Culture, Cultivation of bacteria. Microbial products.

#### Unit II (13 hours)

Plant diversity : Lower and higher group of plants, plant ecosystem and its classification. Major ecosystem types, tropical forests, temperate forests. Arid and Semiarid ecosystems, boreal forests, Arctic and Alpine systems, grasslands, wetland ecosystem. Marine ecosystems, Epiphytes, parasites and orchids. Values and uses of plant diversity.

Animal diversity: Lower and higher group of animals, their ecological niches. Zoogeographical regions of the world and India. Animals in temperate, tropical and boreal forests, cave and mountains, Coastal ecosystems, mangrove and estuaries, coral reefs.

#### Unit III (13 hours)

Biodiversity Conservation: Causes and prevention of Plant and Animal biodiversity loss; IUCN Red List *Categories* and Criteria;

Conservation strategies – *Ex-situ* and *In-situ* conservation, Protected ecosystems – Biosphere reserves, National parks, Sanctuaries, Botanical gardens, Sacred groves; Wildlife conservation and wildlife conservation act; Centers of diversity study.

## REFERENCES

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5. Haywood, V.H. and Watson, R.T., 1995. Global biodiversity assessment. United Nations Environmental Programme, New York.
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- Amsterdam. 264 pp.
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  11. Nybakkan, J.N., 1982. Marine Biology – An ecological approach. Harper and Raw Publ., New York.
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  20. Kushalappa, C.G. and Bhagwat, S.A. 2001. Sacred groves: Biodiversity, threats and conservation. In: Uma Shanker, R., Ganeshiah, K.N. and Bawa, K.S. (Eds.) Forest Genetic Resources: Status, Threats and Conservation Strategies. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, pp. 21-29.
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## **BSE462 CANCER BIOLOGY**

### **Unit I (13 hours)**

Cellular hallmarks of cancer, Molecular biology of cancer development, Cell transformation mechanisms, benign and metastatic tumour, Protooncogenes, Oncogenes and tumour suppressor

genes, Cellular senescence, Telomeres, cellular immortalization and tumorigenesis, Carcinogen-types and identification tests

### **Unit II (13 hours)**

Multistep tumorigenesis, Mechanisms of neoplasia and signaling, tumor virology, Growth factors, receptors and cancer, cytoplasmic signaling circuitry programs and cancer, Cell cycle control, Genome integrity and cancer, pRb and control of cell cycle clock, DNA damage checkpoints and repair, Mismatch repair pathway and cancer

### **Unit III (13 hours)**

Tumor immunology and immunotherapy, rational design of Cancer therapeutics and diagnostics, Cancer nanotechnology, sequelae of cancer and its treatment, Genomic and proteomic technologies and application of new technologies in prevention, assessing risk, diagnostics and treatment of cancer.

### **References**

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5. Cancer Biology, Fourth Edition by Raymond W. Ruddon, Oxford university press, USA, 2007
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