

UNIVERSITY OF LADAKH



SYLLABUS

OF

THE INTER-DISCIPLINARY COURSE

OF

BOTANY

(UNDER NEP – 2020)

(Implemented w.e.f Academic Session 2023-24)

UNIVERSITY OF LADAKH

SYLLABI OF THE INTER-DISCIPLINARY COURSE IN BOTANY UNDER NATIONAL EDUCATION POLICY - 2020 (Session 2023-2024)

SEMESTER: I

Course Title: CELL BIOLOGY

Course Code: LFS-BO-101-G

UNDERGRADUATE INTER-DISCIPLINARY COURSE IN BOTANY (NEP-2020)

Unit 1: Cell as a unit of Life, Plasma membrane (11 Hours)

Principle of microscopy: light microcopy (simple and compound).

The cell theory. Prokaryotic cell (bacterial cell) and eukaryotic cells (plant and animal cell).
Properties of cell.

Plasma membrane: - Structure of plasma membrane; evolution of fluid mosaic model of membrane, fluid mosaic concept, fluidity of bio-membranes. Functions of plasma membrane, carbohydrates in the plasma membrane.

Unit 2: Cell wall, Cell Organelles(11 hours)

Cell wall:-Chemical composition, structure and functions.

Non-membranous organelles: Structure and functions of ribosomes, centrioles and basal bodies

Single membrane bound organelles: Endoplasmic reticulum, Golgi bodies, lysosomes, peroxisomes and glyoxisomes.

Unit 3: Double membrane bound organelles and Cytoskeleton (13 hours)

Double membrane bound organelles: Mitochondria; Structure and functions, semi-autonomous nature, endosymbiont hypothesis.

Chloroplast; Structure and functions, chloroplast DNA. Nucleus; Nuclear Envelope, Chromatin fiber; euchromatin and heterochromatin.

Cytoskeleton: Microtubules, Microfilaments and Intermediate filament (Ifs).

Unit 4: Cell Cycle & Genetic Material (10 hours)

Overview of Cell cycle, Mitosis and Meiosis.

DNA: - Type and structure (Watson and Crick's model). Griffith's and Avery's transformation experiments. Hershey-Chase bacteriophage experiment, Brief introduction of Replication, Transcription and Translation.

Suggested Readings

1. Karp, G. 2010. Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley & Sons. Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. 2006. Cell and Molecular Biology. 8th edition. Lippincott Williams and Wilkins, Philadelphia.
3. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009. The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco.
4. Bruce Alberts & Lewis. Essential Cell Biology. Garland Science.
5. Lodish *et al.* Molecular Cell Biology. W.H. Freeman and Co.
6. David E. Sadava. Cell Biology: Organelle Structure and Function. Jones and Bartlett Pub.
7. P.S Verma and V.K. Agarwal: Cell biology, genetics, molecular biology, evolution and ecology.

UNDERGRADUATE INTER-DISCIPLINARY COURSE IN BOTANY (NEP-2020)

SEMESTER: II

Course Title: Ecology

Course Code: LFS-BO-201-G

Unit 1 Ecosystem (11hours)

Introduction to Ecology and ecosystem

Trophic organisation, food chain, food web, ecological pyramids and energy flow. Biogeochemical cycling: Carbon, Nitrogen and Phosphorous.

Bio-geographical zones and concept of Endemism.

Unit 2: Ecosystem stability and restoration (8 hours)

Ecosystem stability: Resistance, resilience, ecological perturbation and plant invasion. Degradation and Restoration of ecosystem

Unit 3: Ecological factors and Variation (11hours)

Biotic factors, Abiotic factors: Edaphic (soil), Climatic (sunlight, temperature, wind, rainfall and atmospheric humidity) and Topographic factors.

Variation; Adaptation of plants to their variation.

Unit 4: Plant communities (15hours)

Population: concept, characteristic and growth curve.

Species: Types of interaction, Herbivory, Carnivory, Prey-predator, parasitism and symbiosis.

Community: Organisation and characteristics, frequency, density cover, life forms, biological spectrum, Ecotone and edge effect.

Succession: Processes and types, climax concepts.

Suggested Readings

1. Singh, A. (2023). Concepts of Ecology and Environment. Edited by Jagdamba Singh. Pragati Prakashan publications, India.
2. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
3. Singh, J.S. Singh S.P. and Gupta, S.R. (2014). Ecology, Environment and Resource Conservation. S. Chand and Company Pvt. Ltd., New Delhi.
4. Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
5. Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
6. Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition.
7. Singh JS (1993). Restoration of degraded land: concepts & strategies, Rastogi Publications, Meerut, India.
8. Townsend, C.R., Begon, M. and Harper, J.L. 2008. Essentials of Ecology. 3rd Edn. Blackwell publishing. U.K.