

**DSE – Allied BOTANY
SEMESTER II**

(With Microbiology)

19UMBDA201	Botany	3 Hrs/Week	3 Credits
-------------------	---------------	-------------------	------------------

Objective

- This course is survey of the botanical aspects of plant diversity, morphology, physiology Anatomy.
- Improve understanding of the structure functioning of medical botany and plant pathology.
- Development of personal perception of plants and environment.

Unit I: Plant Kingdom

(09 Hrs)

- General characters and classification of Thallophyta.
- General account and outline of classifications of Bryophyta
- General account and outline of classifications of Pteridophyta
- General account and outline of classifications of Gymnosperms
- General account and outline of classifications of Angiosperms

Unit-II Plant Physiology and Plant Anatomy

(09 Hrs)

- Plant-water relations
- Photobiology
- Types of simple tissue
- Types of complex tissue
- Microtomy

Unit- III Plants Products

(09 Hrs)

- Alkaloids yielding plants – Sarp Gandha, Tobacco
- Dye yielding plants – Heena, Kesudo
- Oil yielding plants – Ground nut, Nilgiri

- Resin yielding plants – Pinus, Gugal
- Gum yielding plants – Neem, Baval

Unit- IV Medicinal Plants

(09 Hrs)

- Usage of plants for wellness of respiratory disease – Arduasi, Tulsi
- Usage of plants for wellness of gastrointestinal disease – Kariyatu, Kadu
- Usage of plants for wellness of dermatological disease –, Turmaric, Chandan
- Usage of plants for wellness of cancer disease – Kuvarpathu, Barmasi
- Scope and future of medicinal plants

Unit-V Plant Pathology

(09 Hrs)

- General symptoms of disease
- Tikka disease of ground nut
- Red rot of sugar cane
- Different methods of plant disease control
- Citrus canker

Text Books:

- Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi (For Unit 1, 2, 3, 4).
- Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India. (For Unit 5)

Reference Books:

- Agnes Arber (1999). Herbal plants and Drugs. Mangal Deep Publications.
- Taiz, L., Zeiger, E., MØller, I.M. and Murphy, A (2015). Plant Physiology and Development.
- Sinauer Associates Inc. USA. 6th edition.

PRACTICALS:

19UMBDA202	Botany Practical	6 Hrs/Week	2 Credit
-------------------	-------------------------	-------------------	-----------------

Objective

- This course is survey of the botanical aspects of plant diversity, morphology, physiology Anatomy.
 - Improve understanding of the structure functioning of medical botany and plant pathology.
 - Development of personal perception of plants and environment.
1. Observational study of Blue green algae – Nostoc through specimen and slides.
 2. Observational study of Green algae – Spirogyra through specimen and slides.
 3. Observational study of Brawn algae – Sargassum through specimen and slides.
 4. Observational study of Red algae – Batrachospermum through specimen and slides.
 5. Observational study of Fungi- Mucor through specimens and slides.
 6. Observational study of Fungi- Peziza through specimens and slides.
 7. Observational study of Fungi- Agaricus through specimens and slides.
 8. Observational study of Bryophyta – Marchantia through specimens and slides.
 9. Observational study of Bryophyta – Funaria through specimens and slides.
 10. Observational study of Pteridophyta – Adiantum through specimens and slides.
 11. Observational study of Gymnosperm – Cycas through specimens and slides.
 12. Study of Rotary Microtome.
 13. Demonstrate water potential of given tissue (potato tuber).
 14. To study evaluation of oxygen during photosynthesis.
 15. To study of simple and complex tissue.
 16. To study of plant products – Alkaloids.
 17. To study of plant products – Dye.
 18. To study of plant products – Oil.
 19. To study of plant products – Resin.

20. To study of plant products – Gum.
21. To study of medicinal plants - wellness of respiratory disease.
22. To study of medicinal plants - wellness of Gastrointestinal disease
23. To study of medicinal plants - wellness of dermatological disease.
24. To study of medicinal plants - wellness of Cancer disease.
25. Study of Plant disease.
26. To understand floral formula and floral diagram.

References:

- Bendre & Kumar, A text book of Practical Botany part I & II, 2010, Rastogi Publication, Meerut.
- Dr. B. P. Pandey, Modern Practical Botany (Vol-I, II & III), 2012, S. Chan Publication, New Delhi

**DSE – Allied ZOOLOGY
SEMESTER – I**

19UMBDA101	Zoology	3Hrs/Week	3 Credit
-------------------	----------------	------------------	-----------------

Objectives:

- To provide keen knowledge about classical zoology and animal diversity with derived forms, its important and roll for nature.
- To enhance the students regarding to human system, its structureal organization, anatomy, histology, physiology etc.

Unit -I: Systematic of Chordate animals (09 Hrs)

- An introduction to Invertebrate animals.
- Outline classification of Chordate animals.
- Type study : Scoliodon
 1. Morphology
 2. Digestive system
 3. Arterial system
 4. Reproductive system
 5. Brain.

Unit-II: Histology of Mammals (09 Hrs)

- Integumentary glands.
- Histology of Stomach
- Histology of Pancreas.
- Histology of Thyroid gland.

Unit-III: Digestive system & Respiratory system in human (09 Hrs)

- Structural organization of Digestive track.
- Mechanical digestion.
- Chemical digestion.
- Structural organization of Respiratory system.

Unit-IV: Circulatory system & Excretory System in human (09 Hrs)

- Morphological and internal structure of Human Heart.
- Cardiac cycle.
- Morphology and histology of Kidney.
- Structure of Nephron.

Unit-V: Co-ordinatory system. (09 Hrs)

- Structure and types of Nerve cell.
- Morphological structure of Human Brain
- Endocrine secretion and its function.
 1. Pituitary gland
 2. Adrenal
 3. Ovary and Testis.

Text Books:

- Jain A. K., Textbook of Physiology, Avichal Publishing Company, 6th edition.(for Unit 2 to 5)
- Vander A, Sherman J. and Luciano D. (2014). Vander's Human Physiology: The Mechanism of Body Function. XIII Edition, Mcgraw Hills.(for Unit 2 to 5)
- Jordan E.L. and Verma P.S., Textbook of Chordates, S. Chand Publication, New Delhi.(for Unit 1)

Reference Books:

- Tortora, G.J. & Grabowski, S. (2006). Principles of Anatomy & Physiology. XI Edition John Wiley & sons.
- Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional correlations. XII Edition.Lippincott W. & Wilkins.

PRACTICALS:

19UMBDA102	Zoology Practical	6 Hrs/Week	2 Credit
-------------------	--------------------------	-------------------	-----------------

Objective

- To provide keen knowledge about classical zoology and animal diversity with derived forms, its important and roll for nature in form of Practicals.
- To enhance the students regarding to human system, its structural organization , anatomy, histology, physiology by charts, models, specimen, slides and laboratory facilities.

1. Identification and classification of Invertebrate animals Part I.
2. Identification and classification of Invertebrate animals Part II.
3. Identification and classification of Chordate animals part I.
4. Identification and classification of Chordate animals part II.
5. Study of Scoliodon system - Digestive system.
6. Study of Scoliodon system - Arterial system.
7. Study of Scoliodon system - Reproductive system.
8. Study of Scoliodon system - Brain.
9. Study of temporary mounting in Scoliodon.
10. Histological structure of mammalian organs.
11. Structural organization of Human Digestive system.
12. Digestion of starch by salivary Amylase.
13. To determine the presence of Lipid by qualitative test.
14. Comparative study of Mammalian Stomach.
15. Structural organization of Human respiratory system and T.S. of Lung.
16. Morphological and internal structure of Heart.
17. Comparative study of Heart in higher chordates.
18. Comparative study of Aortic-arch in higher chordates.
19. Morphological and internal structure of Kidney.
20. Comparative study of Kidney in higher chordates.
21. Structure of Nerve cell and Brain in human.

22. Internal anatomy of some endocrine glands.
23. Study of Mitosis.
24. Study of Meiosis.

Reference:

- Jain A. K., Textbook of Physiology, Avichal Publishing Company, 6th edition.(for Unit 2 to 5)
- Vander A, Sherman J. and Luciano D. (2014). Vander's Human Physiology: The Mechanism of Body Function. XIII Edition, Mcgraw Hills.(for Unit 2 to 5)
- Jordan E.L. and Verma P.S., Textbook of Chordates, S. Chand Publication, New Delhi.(for Unit 1)

DSE – Allied ZOOLOGY
SEMESTER – III

19UMBDA303	Sustainable Management	3Hrs/wk	3 Credits
-------------------	-------------------------------	----------------	------------------

Objectives:

This course is designed to provide awareness and importance about

- Environment, its condition and its impact globally and locally
- Need for sustainable management
- Agricultural biodiversity in sustainable growth
- Role of society, corporate and government in sustainable management

Unit 1: Introduction to Sustainable Management (9Hrs)

- What is Sustainable Management?
- Sustainable development and Green Climate Fund
- Introduction to Corporate Social Responsibility and ISO 14001

Unit 2: Basic concepts of Biodiversity (9Hrs)

- Biodiversity – Definition, Types and Importance of Biodiversity.
- Global Distribution of Biodiversity and Biodiversity Hotspots
- Biodiversity in India – Wetlands, Marine Environment, Endemism.

Unit 3 : Agro biodiversity and Food Security (9Hrs)

- Scope and importance of agricultural biodiversity and food Security
- The decline of biodiversity
- Agro ecosystems v/s natural ecosystems, Issues in sustainable agriculture
Food Security and sustainability in India

Unit 4: Threats to Biodiversity and impact of Biodiversity loss on sustainability (9Hrs)

- Extent of Biodiversity Loss
- Biodiversity Threats
- The Indian Scenario
- Protected Areas.

Unit 5: Sustainable use of Biodiversity (9Hrs)

- Sustainable use of Biodiversity.
- National Instruments Relating to Biodiversity Management.
- Conservation Measures of Biodiversity.

Reference Books:

- IGNOU Study Materials
- Verma, P.S., Agrawal, V.K. (2005). Ecology, Cell Biology, Molecular Biology, Genetics. New Delhi: S. Chand and Company Limited.

PRACTICALS:

19UMBDA304	Sustainable Management Practical	6 hrs/wk	2 Credits
-------------------	---	-----------------	------------------

Objectives:

- To provide Practical grips and knowledge for sustainable management.
- To orient the students by diversity its roll, importance and roll in nature.

1. Isolation of micro organism forms various soil samples.
2. Isolation of micro organism forms various water samples.
3. Herbarium preparation for agro diversity.
4. Study of Legumes agro diversity.
5. Study of Cereals agro diversity.
6. Agro diversity study among Bagayati diversity.
7. Study of Insect diversity part I.
8. Study of Insect diversity part II.
9. Pathogenic insects and its effect on the crop.
10. Animal diversity of Invertebrate animals.
11. Animal diversity of lower Chordate.
12. Animal diversity of Higher Chordate.
13. Preparation of permanent slide by Single staining method.
14. Preparation of permanent slide by Double staining method.
15. Study of Agro ecology to compare natural ecosystem.

16. Biochemical test of Adulteration in powder form agro-product.
17. Biochemical test of Adulteration in addible liquids.
18. Group discussion.
19. Case study.
20. Field visit.

References:

- Verma, P.S., Agrawal, V.K. (2005). Ecology, Cell Biology, Molecular Biology, Genetics.
New Delhi: S. Chand and Company Limited.

DSE Allied Zoology

Semester IV

(With Microbiology)

19UMBDA401	Basics Of Ecology	3 Hrs/Week	3 Credits
------------	--------------------------	-------------------	------------------

Objective:

- Educating the students about the need to necessity, conservation and protection about ecology and environment and microbial ecology as welfare of human and its future.
- To enable the students to understand the roll of ecology in environment, its importance, habitat, interaction, and abiotic component cycle etc.

Unit 1: Introduction

- History, basic concepts and scopes
- Origin of life – Theories
- Ecosystem – structure, function and types
- Abiotic factors – Water, Light, Temperature

Unit 2: Habitat Ecology

- Terrestrial Habitat – Soil formation, constituents, types, profile, soil organism
- Aquatic Habitat – Types, Stratification and Zonation
- Atmosphere – Structure and Stratification, Air and Gases, Aerosol
- Habitat loss - Causes and Effects

Unit 3: Community and interaction

- Community - Composition, Structure, Quantitative characters, Qualitative characters.
- Interaction – Mutualism, Commensalism, Antagonism, competition
- Succession – Introduction, General process, Cause, types, Hydrosere, Lithosere.
- Population Dynamics – Size and Density, Dispersion, Age structure, Natality and Mortality.

Unit 4: Biogeochemical Cycles

- Carbon cycle
- Nitrogen Cycle
- Phosphorous cycle
- Water cycle

Unit 5: Microbial Ecology

- History and development, Major contribution
- Soil as habitat natural habitat, Soil microflora
- Air microflora and Microb dispersal
- Microbiomics reference to Human.
- Micro Interaction – with Microb, Plant and Animal.
- Microbial deterioration – Metals, Textile and Paper.

Text Books:

- Arumugam, Concepts of Ecology, seventh edition, 2010, Saras publication.
- Verma, P. S., & Agarwal, V. K. (2015). *Environmental Biology: Principles of Ecology.*, S. Chand publication, New Delhi.

Reference Books:

- Odum, E. P., & Barrett, G. W. (1971). *Fundamentals of ecology.* Philadelphia: Saunders.
- Groom, M. J., Meffe, G. K., & Carroll, C. R. (2006). *Principles of conservation biology,* Sunderland: Sinauer Associates publishing.

PRACTICALS:

19UMBDA402	Basics Of Ecology Practical	6 Hrs/Week	2 Credits
------------	-----------------------------	------------	-----------

Objectives:

- Enhancing the student's practical work about the environmental conservation and protection by ecological grip on hands.
- To enable the students to understand the roll of ecology in environment, its importance, future necessity and control of pollution by practical works.

1. Study of Aquatic ecosystem
 - a. Pond ecosystem
 - b. Oceanic Zonation
2. To Compare the chemical characteristics of soil - I
 - a. pH
 - b. Moisture content
3. To Compare the chemical characteristics of soil - II
 - a. Carbonate content
 - b. Nitrate content.
4. Estimation of Chlorinity in water.
5. Estimation of carbondioxide in tap water.
6. Measurement of water quality, based on Hardness.
7. Measurement of water quality, based on BOD and COD.
8. Study of Biotic-interaction.
9. Study of Ecological adaptation part I.
10. Study of Ecological adaptation part II.
11. To determine 'species Area curve' and community size by quadrat method.
12. To determine Frequency of the community by quadrat method.
13. To determine Density of the community by quadrat method.
14. To determine Abundance of the community by quadrat method.
15. To determine population strength by quadrat method.
16. To calculate Median for community dynamics.
17. To calculate Mode for community dynamics.
18. To calculate Mean for community dynamics.
19. To determine Water holding capacity of the soil from different soil samples.
20. To count planktonic population among polluted water.
21. Study of Marine Habitat and stratification.
22. Habitat study of Desert Area.
23. Habitat study of Forest Area.
24. Habitat study of Fresh water Area.

References:

- Arumugam, Concepts of Ecology, seventh edition, 2010, Saras publication.
- Verma, P. S., & Agarwal, V. K. (2015). *Environmental Biology: Principles of Ecology.*, S. Chand publication, New Delhi.