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**No.36/2, RACE COURSE ROAD, KHAJAMALAI, TIRUCHIRAPPALLI - 620 023
TAMILNADU, INDIA.**

Tel.No. : 0431 - 2420079 Website: www.thanthaiperiyargasc.ac.in E-mail : periyarevrcollege@yahoo.com

Criterion III - Research, Innovations and Extension

3.3 Innovation Ecosystem

3.3.1 Institution has created an ecosystem for innovations, Indian Knowledge System (IKS), including awareness about IPR, establishment of IPR cell, Incubation centre and other initiatives for the creation and transfer of knowledge/technology and the outcomes of the same are evident

Eco System based Syllabus



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M.Sc. Zoology:

Semester IV

Core Course XIV

Hours 6

Credits 5

ENVIRONMENTAL BIOLOGY AND MANAGEMENT

Unit I

Environment: Atmosphere (air), Hydrosphere (water), Lithosphere (soil); Abiotic factors: Temperature and light - Biotic factors - Animal association - Symbiosis, Commensalism, Mutualism, Antagonism, Parasitism, Predators and Competition. **Ecosystem:** Concept, Components - Producer, Consumer, Decomposer, Transformer. Trophic level, Energy flow, Ecological pyramids, Productivity, Food chain, Food web.

Unit II

Community Ecology : Types of Communities; Characteristics of Community - Ecotone - Edge effect; Ecological Niche - Ecological succession. Population ecology : Population size and Density, Natality, Mortality, Population Dynamics; Regulation of Population Size- Emigration, Immigration and Migration.

Unit III

Hazardous waste -Introduction, characteristics-Classification of hazardous waste ; industrial, hospital, domestic. Solid wastes and disposal techniques - Radioactive wastes. Types, and its control – Sewage, and biomedical wastes and their treatment. Air, water, soil and noise Pollution-sources, impacts and control measures. Occupational hazards and diseases.

Unit IV

Environmental monitoring - benefits - types of monitoring - Biological indicators of pollution ;. Bio remediation- approaches and technology of bioremediation,-Role of microorganism in treatment of wastewater.-Role of microbes in soil reclamation.-Principles of Remote Sensing, its Applications in Environmental Monitoring-Recent environmental summits.

Unit V

Geographical Information System(GIS) and its applications,-Global environmental problems; global warming, climate change. acid rain, ozone layer depletion, green house effect, Environmental disasters management ;earthquakes, landslides, floods, droughts, cyclones, Tsunamis, volcanic eruptions and wild fires, -preventive measures.

Text Books

1. Ecology and Environment- by P.D.Sharma, RastogiPublicaitons, X edition, 2009.
2. Fundamentals of Environmental Pollution- by Krishnan Kannan , Chand & Co ., 1997.
3. Concepts of Ecology_ by N. Arumugam. Saras publications. 1983
4. Fundamentals of Ecology - by Eugene P. Odum, III rd Edition, Toppan Company , 1985.



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B.Sc. Zoology: 2015-18

SEMESTER VI
Core Course XI

Hours: 6
Credits: 5

ENVIRONMENTAL BIOLOGY AND TOXICOLOGY

Unit - I

Environment: Atmosphere (air), Hydrosphere (water), Lithosphere (soil); Abiotic factors: Temperature and light - Effect of light and temperature on animals. Biotic factors - Animal association - Symbiosis, Commensalism, Mutualism, Antagonism, Antibiosis, Parasitism, Predators and Competition.

Unit - II

Community **Ecology** : Types of Communities; Characteristics of Community - Stratification - Community interdependence - Ecotone - Edge effect; Ecological Niche - Ecological succession. Population ecology : Population size and Density, Natality, Mortality, Age Structure, Biotic potential, Population Dynamics; Regulation of Population Size- Emigration, Immigration and Migration.

Unit - III

Habitat Ecology: Characteristic features, fauna and their adaptations in fresh water (Pond and river), Marine (pelagic, rocky, sandy, muddy shore), Estuaries, Man grooves of Tamil Nadu: characteristic features, flora and fauna and their adaptations.

TOXICOLOGY

Unit - IV

Scope and importance of Toxicology, Classification of Toxicants - Cardiotoxicants, Immunotoxicants, Hepatotoxicants and Food additives. Routes of entry of Toxicants, LC₅₀ and LD₅₀. Dose response relationship - selection of exposure, Duration of exposure, Types of human exposure. Mode of action of Toxicants, Toxic effect, Toxicological methods - Acute, Sub acute and Chronic toxicity tests.

Unit - V

Environmental toxicology : Introduction and importance of toxicants in atmosphere; toxicants in hydrosphere - domestic, industrial, heavy metals. Bio-magnifications. Environmental monitoring - EIA, EIM.

Textbooks

1. Rastogi, V.B. and M.S.Jayaraj.1997. Animal ecology and distribution of animals. Kedarnath, Ramnath.
2. Verma P.S. and V.K.Agarwal.1996. Principles of ecology. S. Chand and Co., New Delhi.
3. Arumugam, N.1992. Concepts of ecology. Saras publications, Nagercoil

References

1. Claude, F., Christiane, F., Paul, M. and Jean, D.1998. Ecology Science and Practice. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Sood, A. 1999. Toxicology. Sarup & Sons. Darya Ganj. New Delhi.
3. Dr. Kamaleshwar Pandey, Dr. J.P.Shukla, Dr. S.P. Trivedi. 2005. Fundamentals of Toxicology. New central Book Agency P(LTD). Kolkatta -700 009.



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2018-21 syllabus:

SEMESTER VI
CC XI

Hours: 6
Credits: 5

ENVIRONMENTAL BIOLOGY AND TOXICOLOGY

UNIT: I

Environment: Atmosphere (air), Hydrosphere (water), Lithosphere (soil); Abiotic factors: Temperature and light - Effect of light and temperature on animals. Biotic factors - Animal association - Symbiosis, Commensalism, Mutualism, Antagonism, Antibiosis, Parasitism, Predators and Competition.

UNIT : II

Ecosystem: Concept, Components - Producer, Consumer, Decomposer, Transformer. Trophic level, Energy flow, Ecological pyramids, Productivity, Food chain, Food web. **Forest ecosystem**- wild life resources and management, Sanctuaries and National parks. Animal protection Act. Environmental protection Act. Space Ecology.

UNIT: III

Community Ecology : Types of Communities; Characteristics of Community - Stratification - Community interdependence - Ecotone - Edge effect; Ecological Niche - Ecological succession. Population ecology : Population size and Density, Natality, Mortality, Age Structure, Biotic potential, Population Dynamics; Regulation of Population Size- Emigration, Immigration and Migration.

TOXICOLOGY

UNIT : IV

Scope and importance of Toxicology, Classification of Toxicants - Cardiotoxicants, Immunotoxicants, Hepatotoxicants and Food additives. Routes of entry of Toxicants, LC₅₀ and LD₅₀. Dose response relationship - selection of exposure, Duration of exposure, Types of human exposure. Mode of action of Toxicants, Toxic effect, Toxicological methods - Acute, Sub acute and Chronic toxicity tests.

UNIT : V

Environmental toxicology : Introduction and importance of toxicants in atmosphere; toxicants in hydrosphere - domestic, industrial, heavy metals, land, thermal and radiation. Bio-magnifications. Environmental monitoring - EIA, EIM.

Textbooks

1. Rastogi, V.B. and M.S.Jayaraj.1997. Animal ecology and distribution of animals. Kedarnath, Ramnath.
2. Verma P.S. and V.K.Agarwal.1996. Principles of ecology. S. Chand and Co., New Delhi.
3. Arumugam, N.1992. Concepts of ecology. Saras publications, Nagercoil

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1. Claude, F., Christiane, F., Paul, M. and Jean, D.1998. Ecology Science and Practice. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
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M.Sc Zoology.
2015-2018.

Semester IV
Core Course XIV

Hours 6
Credits 5

APPLIED ECOLOGY

Unit I
Types of toxins, Toxicological methods: Acute, Sub-acute, chronic and special tests. Lethal doses. Pollution: Atmospheric, water, land, thermal, noise and radiation pollution, biological and molecular indicators and their role in environmental monitoring.

Unit II
Ecology of Space Travel – Introduction - Environmental problems of space travel: Physiological Changes during space travel, oxygen equipment, pressure suits, Life support system-Storage or non regenerating system, partial regenerating system, complete regenerating system, mechanism of regenerating system, mechanical, Chemo regeneration, Bio-regenerating system - Exobiology - The Extrabiospheric Environment.

Unit III
Remote sensing- Physical basis for remote sensing- Energy and Plant relationships - Energy and Animal Relationships - Process of information extraction - interpretation- The nature of tone and texture - Photogrammetry – Role of remote sensing in ecological research - Inventory and mapping - Quantitating the environment - Flow of matter and energy - Evaluating change and alternative solutions.

Unit IV
Environmental monitoring - Objectives- benefits – classifications ; occupational and general environment monitoring – Biological monitoring : types of monitoring - Ecological effects of monitoring- Biological indications; concepts, advantages and disadvantages - Biological indicators of pollution ; saprobic system - biotic indices – chemical monitor species ; vertebrates, invertebrates, plants – advantages of chemical monitor species - chemical methods of monitoring .

Unit V
Bio remediation- Scope and merits – approaches to bioremediations - ecology of bioremediation - technology of bioremediation – FOCI of R & D for bioremediation ; Complex organic pollutants ; metal polluted soil and sediments – Current status - Phytoremediation - remediation of contaminated sites using plants - Field scale applications.

Text Books

1. Ecology and Environment- by P.D.Sharma, Rastogi Publicaitons, X edition, 2009.
2. Fundamentals of Environmental Pollution- by Krishnan Kannan , Chand & Co ., 1997.
3. Concepts of Ecology_ by N. Arumugam. Saras publications.1983
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17



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B.Sc. Botany:

SEMESTER VI

CORE PAPER- XIII

ECOLOGY, PHYTOGEOGRAPHY AND CONSERVATION BIOLOGY

Hours: 5
Credits: 4
Code:

Objectives: The world is in a period of unprecedented environmental change. Learning how to live sustainably on this planet is going to require that humanity learns how to utilize and manage our natural resources more effectively and this paper will deal this.

Unit - I

Ecology – Definition; Plant Ecology and its divisions. Approaches to the study of Ecology – Autecology and Synecology. Applications of Plant Ecology. Factors influencing plant environment – climatic, edaphic and biotic factors.

Unit - II

Ecosystem concept – components of ecosystem- biotic and abiotic – producers, consumers and decomposers. Ecological pyramids, Food chain and Food web. Pond ecosystem. Grassland ecosystem. Units of vegetation – formation, association, consociation and society. Development of vegetation – migration, ecesis and colonization. Plant succession – Hydrosere and Xerosere.

Unit - III

Pollution types and its control –air pollution, water pollution, soil pollution, noise pollution, thermal pollution and radioactive pollution.

Unit - IV

Phytogeography – Basic principles – Theories of Continental drift, continuous and discontinuous distribution. Endemism – age and area hypothesis – Altitudinal and Latitudinal distribution of vegetation. Vegetation of India. Characteristic features of different types of forest and forest conservation.

Unit -V

Categories of Flora as per IUCN - Conservation of Genetic Resources – Red Data Book – Need for conservation. *in situ* and *ex situ* Conservation. Biological hot spots. Reserve Forests and Social Forestry. Sacred Groves. Buffer zones and role of tribes in conservation.

Text Books

1. Shukla, R. S. and Chandel, P. S. 2015. Textbook of Plant Ecology. S. Chand Publications



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SEMESTER II
ALLIED BOTANY III

Hours: 4
Credits: 4
Code:

Objectives: To learn about internal structure, morphogenesis, internal physiology of plants and Environment factors.

Unit – I (Cytogenetics)

Structure and functions of Cell wall , Plasma membrane , Chloroplast, Mitochondria, Golgi bodies, Endoplasmic reticulum and Nucleus. Mendel's Laws – Monohybrid and Dihybrid Cross.

Unit – II (Anatomy)

Structure, types and functions of Parenchyma, Collenchyma and Sclerenchyma. Structure of Xylem and Phloem components. Primary structure of Monocot stem and Dicot stem; Monocot root and Dicot root ; Monocot leaf and Dicot leaf.

Unit – III (Embryology)

Structure and development of anther- Male gametophyte. Structure and types of Ovules, female gametophyte (*Polygonum* type) – Structure and types of Endosperm .

Unit – IV (Plant Physiology)

Absorption of water. Transpiration and factors influencing the transpiration. Photosynthesis – Light and Dark reactions - C₃ Cycle. Respiration – Glycolysis, Krebs's Cycle. Growth Hormones: Auxins, Gibberellins and Cytokinins

Unit – V (Ecology)

Autecology – Synecology – Components of ecosystem – Pond ecosystem – Grassland ecosystem - Food Chain – Food Web – Ecological adaptations of Xerophytes – *Nerium*. Hydrophytes – *Eichhornia*.

Text Books

1. Ganguly A.K. 1971, General Botany, Vol.I. The New Book Stall, Calcutta.
2. Rao. K.N. Krishnamurthy K.V. and Rao. G., 1979, Outlines of Botany, Viswanathan Private Ltd.
3. Dutta A.C., College Botany, Vol. I & II.