Ecology

1. Conservation Ecology

1.1. Concepts of conservation ecology and major ecosystems
1.2. Relationship among plants, animals and the environments
1.3. Ecological hazards and their causes, consequences and management techniques
1.4. Types and status of natural resources: nature and status,
1.5. Causes of natural resource depletion and consequences, and
1.6. Efforts and approaches to conserve the natural resources
1.7. Management of ecosystems, species and genetic diversity
1.8. Recent trends in conservation education.
1.9. Different organizations involved in conservation education and research in Nepal
1.10 Analysis of achievements and gaps in conservation education and research

2. Microbial Ecology

2.1. Biology and ecology of microbes
2.2. Interrelationship of microbes with humans, plants, animals and the environment
2.3. Recent trends in microbial ecology education and research
2.4 Application of microbial ecology in environmental conservation
2.5. Role of microbes in the management of environmental problems
2.6. Impact of pesticides and environmental pollutants on useful microorganisms
2.7. Research methods of microbiology
2.8. Lab techniques to study microbes
2.9. Isolation and enumeration techniques of algae, fungi and bacteria

3. Ecological Agriculture

3.1. Nature, functions and ecological processes in ecological agriculture
3.2. Conservation strategies of agricultural ecosystems of Nepal and world
3.3 Nature, physical and social structure and exchange of mass and energy in agricultural ecosystems
3.4. Ecological concepts and principles of sustainability in ecological agriculture
3.5. Different types of ecological agriculture followed in the world
3.6. LISA, LEISA, Organic agriculture, Permaculture, Nature and Natural farming
3.7. Application of ecological approaches in different farming systems
3.8. Status of education and research in ecological agriculture in Nepalese context

4. Applied Ethnobotany

4.1. Concepts, Scope and prospects of ethnobotany
4.2. Methodologies and approaches in ethnobotany research
4.3. Ecological ethnobotany
4.4. Cognitive ethnobotany
4.5. Traditional botanical knowledge, skill and techniques in plant resources
4.6. Application of ethnobotany for sustainable management and conservation of plant resources
4.7. Conservation of food plants, medicines and other non-timber forest products
4.8. Ethics and laws related to physical and intellectual property rights

5. Natural Resource Management

5.1. Concepts and role of natural resources
5.2. Management of demand and supply
5.3. Market equilibrium and pricing systems
5.4. Production and consumption equilibrium of natural resources management
5.5. Tools and techniques for input-output analysis
5.6. Valuation techniques of non-marketed goods and services
5.7. Basis of economic policy related to natural resources management
5.8. Community participation in natural resource management
5.9. Sustainable development
5.10. National legislations in protecting natural resources.

6. Wetland Ecology

6.1. Concepts, scope and types of wetlands.
6.2. Origin, feature, biology, geochemistry, physics, values, functions and productivity of wetlands.
6.3. Limnology
6.4. Wetland flora, fauna, and agriculture in Nepal and south Asia
6.5. Conservation and management of wetlands
6.6. World conventions on wetlands, legal aspects of wetland conservation
6.7. Institutional capability in wetland management
6.8. Awareness and community involvement in wetland management

7. Biodiversity Management

7.1. Concepts and organization level of biodiversity
7.2. Dynamics of population and communities
7.3. Ecosystem and Species conservation
7.4. Ecosystem functions and biodiversity
7.5. Plant-animal interactions and keystone species.
7.6. Ecosystem management approaches
7.7. Types and management of conflict
7.8. Laws and conventions related to biodiversity management and conservation
7.9. Methods of wildlife conservation and management
7.10 Study methods of ecosystems, communities and populations of plants and animals

8. Agro ecotourism

8.1. Concepts, principles, types and status of agro ecotourism
8.2. Trends in ecotourism and agro ecotourism in protected areas and farming systems
8.3. Research methods in tourism
8.4. Components of agro ecotourism
8.5. Tourism planning and management
8.6. Tourism products development using participatory approaches
8.7. Designing infrastructure, recreational, and interpretational facilities and code-of-conducts
8.8. Process of tourism development in community
8.9. Managing tourism impacts in community

9. Environmental Impact Assessment

9.1. Concepts, importance and scope of EIA
9.2. Stages of EIA project cycle;
9.3. EIA methodology
9.4. Impact prediction, evaluation and comparisons of alternatives
9.5. Mitigation measures; compliance and enforcement; role of civil society
9.6. Integrative Impact Assessment
9.7. Legal measures
9.8. EIA education in Nepal

10. Agricultural Biodiversity and Climate Change

10.1. Concepts and components of agricultural biodiversity
10.2. Centers of origins of crops and animal diversity
10.3. Status of education and research of agricultural biodiversity
10.4. Social and economic value of agricultural biodiversity
10.5. Threats and conservation approaches to agrobiodiversity
10.6. Policies and Laws related to agrobiodiversity conservation and management
10.7. Concept and overview of climate change
10.8. Local innovation and practices in agrobiodiversity conservation
10.9. Local innovation and practices in climate change
10.10. Impact of climate change in agrobiodiversity and food security

11. Environmental Science and Ecology

11.1. Concept, branches and Scope of Environmental Science
11.2. Environmental issues
11.3. Environmental impacts
11.4. Environmental management strategies
11.5. Effect of global warming in agriculture
11.6. Ecology in relation to agriculture (farmhouse ecology, population ecology)
11.7. Ecological principles
11.8. Agricultural ecosystem dynamics
11.9. Production and sustainability of agro ecosystems
11.10. Analysis of sustainable agro ecosystems

12. **Medicinal and Aromatic Plants (MAPs)**

12.1. History, importance, prospects and constraints of medicinal and aromatic plants
12.2. Classification of medicinal and aromatic plants
12.3. Economics of medicinal and aromatic plants
12.4. Trade of medicinal and aromatic plants
12.5. Research status of MAPs in Nepal
12.6. Extraction methods for MAPs
12.7. Storage methods for MAPs
12.8. Extension of MAPs in Nepal
12.9. Institutions working in MAPs in Nepal