Gandaki University
Gandaki Province, Pokhara, Nepal

Title: Syllabus
Subject: Research/Innovation
Unit: Directorate of Research
Post: Assistant Professor/Lecturer-Research

A. Biophysical and Forest Environment: Conceptual Understanding

Physical and Biological Environmental: a) Nature and functioning: atmosphere, hydrosphere, lithosphere and biosphere, climatic components, climatic variation; b) human impacts on the functioning of the atmosphere, hydrosphere, lithosphere and biosphere; c) biophysical issues and their importance in sustainable management of the environment, d) biosphere and H_2O, C, N, O, S, P cycle, biotic communities; e) concept of productivity-gross and net; ecosystem types; f) function and stress: concepts of ecosystem; g) homeostasis and structure of an ecosystem, function of ecosystem; h) types of ecosystem: aquatic, terrestrial, agricultural landscape, food chain, food webs, tropic levels, ecological pyramids, ecosystem energetic, ecological succession, eco-tones, edge effect, adaptation and ecotypes, ecological niche.

Forest Environment: a) Forest Environment: Forest ecosystem; role of forest in environment; b) forest resources: forest types and their characteristics; c) distribution of forest area by types; composition of forest vegetation in different eco-types

B. Environmental Pollution, Assessment and Management tools and System

Environmental parameters and pollution control measures: a) Environmental quality and pollution (air, water, soil, noise and light); types of pollutions and its control; b) Solid and Hazardous Waste Management: Sources, types, composition & properties of municipal solid waste (MSW); c) Integrated management of MSW; d) various initiatives, policy, plan, and strategy level and legislation and institutional development related to waste management.

Concepts, theories and methods of various EMS tools: a) Environmental management system and tools; b) Life Cycle Assessment (LCA), Overview, history, LCA types, principles and methods, and application of LCA; c) Quantitative and qualitative Risk Assessment: Human health risk assessment, ecological risk assessment.

Application of Tools in Environment Assessment: a) EIA, IEE, Strategic Environmental Assessment (SEA); b) Multi-criteria Decision Analysis Hierarchy of decision, Decision making models - Intelligence phase, Design phase, Choice phase c) Application of remote sensing and GIS in environment assessment d) research and case studies related to environment assessment and analysis.

Environmental management decision: a) Quality Management System: Evaluation of organization and products; b) ISO 9000, ISO 14000 and ISO 18000, environmental performance evaluation, environmental auditing, activities in Nepal; c) Cleaner Production: Cleaner production and cleaner development mechanism, Principles of CP, environmental labeling, eco-design, CP activities in Nepal.

C. Ecosystem Services Assessment and Valuation

Basic concept of ecosystem theories, ecosystem structure and function: a) ecosystem theories (self-organization, hierarchy, orient or, thermodynamics); b) biodiversity; ecosystem health and integrity; disturbance; c) Typology of ecosystem services; ecological resilience and adaptability; challenges of ecosystem services.

Valuation of ecosystems services: a) concept of ecosystem service evaluation; b) types of evaluation of ecosystem services (ecological and economic valuation); c) economic value of ecosystem service; consumptive use; d) productive use; assessment/analysis of ecosystem services.

D. Climate Change: Concept, its impact, mitigation and adaptation measures

Concept on climate system: a) defining concepts and terminologies, theories and drivers of climate change, climate change indicators, climate modelling; b) Greenhouse gas, global warming and climate change; greenhouse gases effect and global warming, global warming potential.

Impacts of climate change: a) Impacts on different sectors (living being, forest, agriculture, livelihood), b) Extreme impacts: Risk, hazard, vulnerability and climate change induced disasters: Introduction, types of climate induced hazards, vulnerability to climate change, framework for DRR and DRR tools, climate change risk management in Nepal Practical exercise.

Mitigation& Adaptation limiting climate change: a) Concept of mitigation, mitigation options, mitigation approaches, mitigation strategies applied in Nepal (for e.g., REDD+); b) Living with climate change.

E. Environmental Governance Policy and Legislations

Governance: a) Overview of global environmental issues; b) Human dimension and environment and Global environmental governance; c) Major elements of environmental governance (participation, transparency, accountability and governance norms) and d) Key steps adopted for global environmental governance.

Initiatives for Environmental Management: a) Policies, Plans, Strategies and Environmental Laws; b) Role of Judiciary for Protection of the Environment, Policies and Laws to Address Climate Change; c) Trade and fiscal Laws for Environmental Management.