

matrices in Environmental Impact assessment.

UNIT III (13 hours)

Probability: Definition, random variables, expected value. Probability Distributions - Normal, Binomial and Poisson Distributions. Statistical hypothesis testing-basic approach, alternative hypotheses. One sample tests - Z-test on a mean with known variance, T-test on a mean with unknown variance, Z-test for non-zero correlation. Two sample tests- T-test on unpaired means with unknown variance. T-test on paired means with unknown variance. F-test for equal variances, Z-test for unpaired equal correlations, Chi Square test, ANOVA.

References:

1. Aslam Mahmood. Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
2. Gupta, S.C. and Kapoor, V.K. 2012. Fundamentals of Mathematical Statistics, S. Chand & Co.
3. Medhi, J. Statistical Methods: An Introductory Text, New Age International Ltd. Publishers.
4. Singh, Practical Statistics, Vol. 1 and 2, Atlantic Publishers.
5. Ott, W. R., Environmental Statistics and data analysis, Lewis Publishers, New Jersey.
6. Piegorsh, W.W. and Bailer A. J. Statistics for Environmental Biology and Toxicology.
7. Singh, Practical Statistics, Vol. 1 and 2, Atlantic Publishers.
8. Snedecor, G. W. and Cochran, W.G. Statistical Methods.

ESS415 ENVIRONMENTAL LAWS AND POLICIES

39 hrs.

Course Outcomes:

- CO1 Study environmental legislations in detail.
CO2 Describe the role of nodal agencies in environmental protection.
CO3 Learn various Acts related to air and water pollution.
CO4 Study the scheme of labelling of environment friendly products.

UNIT I (13 hours)

Current status of environment; Environmental Challenges-Causes and Impacts; Environmental protection-scope and objectives; Principles, Strategies and Actions under National Environment Policy; The constitution of India-Article 21, Article 38, Article 48, Article 51 in detail; Role of nodal agencies in India for environmental protection- Ministry of Environment, Forest and Climate Change (MOEFCC).

UNIT II (13 hours)

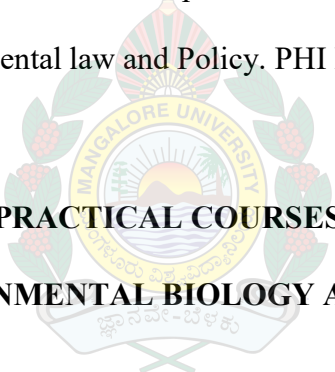
The Water (Prevention and Control of Pollution) Act, 1974; The Water (Prevention and Control of Pollution) Rules, 1975; The Water (Prevention and Control of Pollution) Cess Act, 1977; The Water (Prevention and Control of Pollution) Cess Rules, 1978; The Air (Prevention and Control of Pollution) Act, 1981; 1982; The Air (Prevention and Control of Pollution) (Union Territories) Rules, 1983.

UNIT III (13 hours)

The Environment (Protection) Act, 1986; The Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008; Scheme of Labelling of Environment Friendly Products (Eco-Mark); Bio-Medical Waste Management Rules, 2016; The Plastics Manufacture, Sale and Usage Rules, 1999; The Construction and Demolition Waste Management Rules, 2016; The Municipal Solid Wastes (Management and Handling) Rules, 2000; The Noise Pollution (Regulation and Control) Rules, 2000; The Ozone Depleting Substances (Regulation and Control) Rules, 2000; The Batteries (Management and Handling) Rules, 2001; E-waste (Management) Rule, 2016.

References:

1. Dass, S. S. 2012. Environmental Law in India. Pace University.
2. Doabia, T.S., Dobia, I.P.S. and Dobian, M.S. 2017. Environmental & Pollution Laws in India. Lexis-Nexis Publisher. Gurgoan. India.
3. Environmental Laws in India- An Introduction. CPR Environmental Education Centre.
4. Gazette Notification Govt. of India (on all Acts-law and rule).
5. Kohli, K and Menon, M. 2021. Development of Environmental Law in India. Cambridge University Press.
6. Mohanty, S. K. 2016. Environmental and pollution laws. Universal law publishing company, New Delhi.
7. Venkat, A. 2011. Environmental law and Policy. PHI Learning Pvt. Ltd. New Delhi.



PRACTICAL COURSES

ESP416 ENVIRONMENTAL BIOLOGY AND ECOLOGY LAB.

Course Outcomes:

CO1 Conduct experiments to detect the physico-chemical and biological properties of water.
CO2 Understand intertidal region and mangrove vegetation.
CO3 Enhance the theoretical knowledge of environmental biology with lab experiments and observation of specimens.
CO4 Learn algal indices.

1. Study of microbial flora/planktons found in water/soil samples including pond bottom sediments.
2. Determination of Total alkalinity of different water samples.
3. Estimation of chloride in the water samples.
4. Study on biomes.
5. Determination of biological productivity in water.
6. Estimation of Nygaard's algal indices in a given water sample.
7. Determination of Total Hardness of different water samples.
8. Study of aquatic communities – Aquatic plants and animals.
9. Study of intertidal organisms.
10. Study of mangrove vegetation.