



DEPARTMENT OF GEOLOGY PERIYAR UNIVERSITY SALEM - 11.

*February
2020*

Value Added Course on :

HYDROLOGY AND WATER MANAGEMENT

Objective



- The course is to present the water cycle on and under the Earth's surface, the physical, chemical and biological interactions between the hydrosphere, the lithosphere, the atmosphere and the biosphere.
- An in-depth understanding of theory and concepts in surface and subsurface hydrology.
- To evaluate and analyze hydrological system and processes in a wide range of scale in both space and time for the purpose of water resources assessment.
- To assess effectiveness of, explore promising directions for, identify water management strategies, including those addressing the infrastructure and water management issues.
- To estimate quality and quantity of water available for various purposes and to develop the skills for sustainable Development and management.

Organizing Department : Geology

Date : 13.02.2020

Course duration : 30 hours

Course code : 19PGGE0VA02

Course coordinator : Dr.A.Thirunavukkarasu

Coordinator contact email- Id : thirugeo_au@yahoo.com

February 2020



DEPARTMENT OF GEOLOGY PERIYAR UNIVERSITY SALEM - 11.

Value Added Course On: Environmental Studies and Earth science

Objective

- Recognize the interconnectedness of multiple factors in environmental challenges
- Gain a variety of experience and acquire a basic understanding and knowledge about the environment and its allied problems.
- Develop the ability to evaluate measures for the improvement and protection of the environment.
- Environmental impacts of exploration, remediation, and hazardous materials and Management of Geo environmental data and information systems.
- Dissemination of knowledge on techniques, methods, approaches and experiences to improve the environment.
- To generate academic platform that support interdisciplinary and research-oriented approach to understanding and evaluating the systems originating from nature and human.



Organizing Department : **Geology**

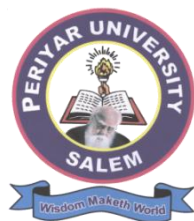
Date : **13.02.2020**

Course duration : **30 hours**

Course code : **19PGGEOVA01**

Course coordinator : **Dr.A.Thirunavukkarasu**

Coordinator contact Id : **thirugeo_au@yahoo.com**



PERIYAR UNIVERSITY, SALEM-11

DEPARTMENT OF GEOLOGY

SYLLABUS FOR VALUE ADDED COURSE ENVIRONMENTAL STUDIES AND EARTHSCIENCE

Paper code: 19PGGEOVA01

Unit I

Renewable and non-renewable resources : Natural resources and associated problems- Forest resources : deforestation- Timber extraction, mining, dams and their effects on forest - Water resources - Use and over-utilization of surface and groundwater-floods- Energy resources - Growing energy needs-renewable and non renewable-energy sources- use of alternate energy sources- man induced landslides- desertification- Equitable use of resources for sustainable lifestyles.

Unit II

Structure and function of an ecosystem- Producers- consumers and decomposers-Energy flow in the ecosystem- Ecological succession-Food chains-food webs and ecological pyramids- Introduction-types- characteristic features- structure and function of the Forest ecosystem- Grassland ecosystem-Desert ecosystem-Aquatic ecosystems

Unit III

Definition-Cause effects and control measures of Air pollution-Water pollution-Soil pollution-Marine pollution-Noise pollution-Thermal pollution-Nuclear hazards-Solid waste Management – Causes- effects and control measures of urban and Industrial wastes-Disaster Management -floods- earthquake- cyclone and landslides

Unit IV

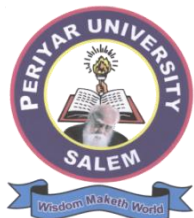
Mechanical layering of the Earth-lithosphere- asthenosphere- mantle and core- Earthquake and earthquake belts: seismic waves and internal constitution of the Earth-Volcanoes and volcanism-distribution of volcanoes-Concept of isostasy-Formation of core-mantle- crust-atmosphere-hydrosphere and biosphere-Convection in Earth's core

Unit V

Origin and Age of the Earth, Historical development of the concept of continental drift and plate tectonics-Plates and plate boundaries-Geodynamic elements of Earth- mid oceanic ridges- trenches- transform faults and island arcs-Plate tectonics- mountain belts and rift valleys.

REFERENCE BOOKS

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India, Email:mapin@icenet.net (R)
2. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
3. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
4. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
5. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
6. Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment Cambridge Univ. Press 1140p.
7. Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
8. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
9. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
10. Duff, P. M. D. and Duff, D. (Eds.) (1993). Holmes' principles of physical geology. Taylor and Francis.
11. Emiliani, C. (1992). Planet Earth: cosmology, geology, and the evolution of life and environment. Cambridge University Press.
12. Gross, M. G. (1977). Oceanography: A view of the earth.
13. Tarback, E. J. and Lutgens, F.K. (2006). Earth Science. Pearson Prentice Hall, New Jersey.
14. Grotzinger, J., Jordan, T.H., Press, F and Siever, R. (2007) Understanding Earth (Fifth Edition). W. H. Freeman and company, New York. Science (TB)



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DEPARTMENT OF GEOLOGY

SYLLABUS FOR VALUE ADDED COURSE HYDROLOGY AND WATER MANAGEMENT

Paper code: 19PGGEOVA02

Unit I

Introduction-Hydrologic cycle-Climate and water availability- Water balance- Precipitation- Forms- Classification- Variability- Measurement- Data analysis- Evaporation and its measurement- Evapotranspiration and its measurement- Penman Monteith method-Infiltration- Factors affecting infiltration-Hyetrograph-Runoff- drainage basin characteristics- Hydrograph concepts assumptions and limitations of unit hydrograph.

Unit II

Occurrence and movement of groundwater- Darcy's law-governing ground water flow equations-Factors governing ground water flow- Types of aquifers- porosity- specific yield-specific Retention-storage coefficient-permeability- hydraulic conductivity- hydraulic transmissibility-Conjunctive use and its necessity. Types Investigations- Site selection- Zones of storage - Safe yield- Reservoir capacity- Reservoir sedimentation and control.

Unit III

Indian rivers and floods- Causes of flooding- Alleviation- Levees and flood walls Floodways-Channel improvement- Flood damage analysis-Design flood- Flood estimation-Frequency analysis- Flood routing through reservoirs and open channels- Storm drainage design.

Unit IV

Definition of drought- Causes of drought- measures for water conservation and augmentation-drought contingency planning-Water harvesting: rainwater collection-small dams-runoff enhancement- runoff collection- ponds- tanks- natural and artificial ground water recharge methods

Unit V

Introduction - Components of Hydroelectric Power Plant-Levels in planning-Functional requirements of water resources projects-steps in water resources planning- Environmental aspects in water resources planning.

REFERENCE BOOKS

1. Garg S.K., Hydrology and Water Resources Engineering
2. Subramanya, K., Engineering Hydrology, Tata McGraw Hill, New Delhi.
3. Raghunath, H.M., Groundwater, 1987, Wiley Eastern Ltd., New Delhi.
4. Modi, P.N., Irrigation Water Resources and Water Power Engineering, Standard Book House, New Delhi.
5. Todd, D.K., Groundwater Hydrology, 1993 John Wiley & Sons..
6. Raghunath, H.M., Hydrology – Principles, Analysis and Design, 1986, Wiley
7. Dr. P.Jaya Rami Reddy, A Textbook of Hydrology, University Science Press.