UNIVERSITY OF RAJASTHAN

JAIPUR

SYLLABUS

(Annual)

P.G Diploma in Water Conservation
&
Management

Examination 2017

Dy. Registrar (Acad.)
University of Rajasthan
JAIPUR

Proposal of the revival of the Centre for Water Management and Research to be placed before Academic council

The Centre for Water Management and Research was established during the academic session 2010-2011 with the aim to make general public aware about the significance of water management and research. Keeping in view the water scarcity problem in the state of Rajasthan in general and the problem of portable water particularly in some parts of Rajasthan, it is necessary to revive this center.

Steps, which will be taken up after the approval of the academic council

1. The center can be functional by organising lectures from eminent persons working for ground water or water management. The university may decide the remuneration and other facilities such as provision in the university guest house for eminent experts.
- This will impart knowledge and technologies to people to make them aware how water can be saved: conservation, water harvesting, and groundwater recharge.
- To achieve the objective of sustainable development of water resources and optimum utilisation of this scarce and precious natural resources
- Effect of ground water on climate and the environment

2. To organize one to two months technical training to the interested persons from different organization/NGO/individual capacity/architects regarding groundwater condition and subsurface geology so that the rainwater harvesting execution work can carried efficiently in the field. A certificate will be issued to the trained and successful candidates. On the basis of this certificate the candidates can enrolled in JDA and a Nagar Nigam, etc. The university may decide the fee structures (training at the centre and in the field) for such candidates.
- The participants should also be taken in the field to known the actual working and design of the structure.
- We need to procure/fabricate different types of harvesting models for display and training, e.g. according to the roof top area, annual rainfall, specific subsurface formation, etc.

3. To motivate young and old faculty members to apply to DST/CSIR/Ministry of water resources for research projects on several aspects of water.

4. To start water analysis for the quality of water: all the chemical and ground water data should be procured from state and central groundwater board and PHED, so that the information may be shared for with the desired persons as it is a very important part related to the groundwater harvesting and awareness.

5. To plan for water harvesting system on the campus of University of Rajasthan

6. To run one year PG Diploma course. The university may decide the fee structures for such candidates.
Duration of PG Diploma Course: one year (180 working days)
Mode: SFS
Procedure for admission: through merit (as per university norms)
Minimum Eligibility: Graduate from any discipline

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Maximum no. of seats: 30
Fee: 20,000/- per student for one year + examination fee of the university

Scheme of Examination

Annual
Total marks: 400
No. of papers: 4, each of 100 marks
Paper I (Management and Monitoring of Water Resources)
Paper II (Water Pollution and Quality Assessment)
Paper III: Policies, Administrative machinery community involvement and water analysis
Paper IV (Survey, Seminar and Dissertation)

Why there is a need to study Diploma in Water Management?
PG Diploma in Water Conservation & Management will prepare graduates for a technical and non-research career in water resource management and to develop innovative and effective methods for the sustainable management of this critical resource in Rajasthan. The water management program aims to guide future generation for a sustainable exploitation of water. The successful candidates will be part of a growing and vibrant global professional network of water management group
For the students with Geology background with diploma in Water Management preference should be in the state and central ground water departments (a recommendation to this effect should be sent to all the PSCs.
Similarly, for state like Rajasthan, it should be made **mandatory** in all the jobs to have knowledge of water resource Management.
The syllabus should be made so simple that even students of all faculties are able to understand.

7. Constitution of COC of Center for Water management and research (has already been constituted, see Annexure 1)

8. Appointment of one more deputy director who can continue as director after the retirement of Director (II line of defence).

9. Preparation of Syllabus (discussed & Prepared in the first meeting of COC held on 16.05.2016, syllabus enclosed).

10. Three proposals may be send to the Government of Rajasthan:
a) The candidates successfully complete the Diploma Course should be given benefit in all the appointments of the State. The norms may be decided by the Government.
b) The candidates successfully complete the Diploma Course should be given benefit in admission for higher class in any of the University of the State.
c) One to two months technical training should be made mandatory for persons interested in taking up profession where water is involved or where water can be conserved or harvested. For example farmers, mine owners, NGOs, architects, house builders, persons working in government organizations, etc..

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University of Rajasthan
J.L.N.Marg, Jaipur 302004

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Syllabus

Paper I (Management and Monitoring of Water Resources)

Section A

Water and its importance. Scenario of water in Rajasthan: sources, geographical distribution, quality. Water (hydrological) cycle, influence of human activity on the water cycle
Surface water resources. Elementary knowledge of ground water: general aquifer. Water quality and its impact on human beings.

Section B

Water harvesting: need, principles of water harvesting, general water harvesting methods - rain water harvesting - roof top rain water harvesting mostly used in urban areas, subsurface barrier/dykes, farm ponding, etc mostly used in rural areas. Groundwater recharge. Revival of traditional techniques for water harvesting. Calculation of available rain water for harvesting. Preparation of suitable technical drawing and design of rain water harvesting structure

Section C

Water conservation: importance, elementary knowledge regarding conservation/saving of water in daily use, in agriculture, in industries. Subsurface investigation of Ground water: general, geophysical methods and its importance. Present law regarding water management
Water footprints.

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Paper II (Water Pollution and Quality Assessment)

Section A

Soil & aquifer Properties and their effect on groundwater. Different types of pollutants. Effects of pollutants on water quality, organisms and human health. Water borne diseases and disease control. Feasible water treatment technologies: treatment techniques of used water, use of recycle water, case studies.

Section B

Water supply in urban and rural areas: techniques for water supply in rural areas. National rural drinking water program - rural water quality monitoring and surveillance- operation and maintenance of rural water supplies. Quality issues in water supply. Different methods to conserve water in industries: water recycling.

Section C

Different methods to conserve water in agriculture: sprinkler, drip irrigation, root irrigation, use of polymers, organic amendments usage, dry land farming, agro-forestry, cover crops growing, no till farming, orchard development, rotational crop method (alternate sowing method, alternate irrigation), water saving economic crops.

Paper III: Policies, Administrative machinery community involvement and water analysis

Section A

Act/policies related to water management/conservation at Central and State levels.
Administrative machinery for implementation: from State to Panchayat levels.

Section B

Community involvement in water management: roles of Panchayati Raj institutions, NGO's, educational institutions, media, political parties and farmers associations.

Section C

Elementary idea of water analysis and instruments used (chemist). Chemical analysis with the help of portable instrument

Paper IV (Survey, Seminar and Dissertation)

Section A

Visit of existing harvesting structures and their workings.
To propose the suitable design of roof top rain water harvesting structure of a given building.
To propose the suitable design for rain water harvesting structure of a given area: rural or urban.

Section B

Community activities (Practical)
Theme - Status of water- availability, utilization and conservation
Use of participatory approaches for need assessment
Planning, preparation and use of visual Aids: poster, Charts, leaflets, Flannel graphs, Flash graphs.

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Develop skills in extension activities: demonstrations, drama/role play, puppet show, focus group discussions, and bulletin book display

Section C

Water analysis with the help of portable instrument.

Resource persons

1. All the members of COC of Centre for Water Management & Research, University of Rajasthan
2. Shri Ashok Kumar Pandey (Retd Sr. Geophysicist, GWD, Jaipur), 157, Shri Vihar Colony, behind Hotel Clarks Amber, JLN Marg Jaipur302018, tele. +91 9462000134
3. Shri Yogesh Sharma (Retd. Sr. Hydrogeologogist), A-73, Vinoba Bhave Nagar, Vaishali Nagar, Jaipur 302021, tele. +91 9929610921
4. Dr. Vinay Bhardwaj (Sr. Hydrogeologogist) for Rain water harvesting
5. Dr.Kailash Sharma (Chemist in GWD, Jaipur) for chemical analysis and instrumentation
6. Faculty members from different departments of the University of Rajasthan, or any other person outside the university recommended by COC members and/or approved by Director of the centre.

Books recommended:

1. Ahuja, Satinder 2008, Arsenic Contamination of Groundwater: Mechanism, Analysis, and Remediation WileyIntersci
2. Bennison, E. W.1947, Ground water: its development, uses & conservation CornellU
3. Bisson 2004, Modern Groundwater Exploration, Drilling, Testing and Integrated WileyIntersci
4. Bitton 2005, Wastewater Microbiology, Third Edition (Online Version) WileyIntersci
5. Edmunds 2008, Natural Groundwater Quality WileyIntersci
6. Erach Bharucha Textbook for Environmental Studies For Undergraduate Courses of all Branches of Higher Education by for University Grants Commission
7. Ganoulis 2009, Risk Analysis of Water Pollution WileyIntersci
8. Gibbons 1994, Statistical Methods for Groundwater Monitoring WileyIntersci
9. Gibbons 2009, Statistical Methods for Groundwater Monitoring, Second Edition
10. Hamilton 2004, Pesticide Residues in Food and Drinking Water - Human Exposure an WileyIntersci
11. Kazemi 2006, Groundwater Age WileyIntersci
12. Misstear 2006, Water Wells and Boreholes WileyIntersci
13. National Research Council 2004 Indicators for Waterborne Pathogens NatAcadPr
14. Singhal, B.B.S. and Gupta, R.P., 1999, Applied Hydrogeology of Fractures Rocks, Kluwer Publishers
15. Todd, D.K. 1980, Ground water Hydrology, John Wiley and Sons
16. Water Resources Management - eolss www.eolss.net/ebooklib/ebookcontents/E2-16-ThemeContents.pdf For more information of *e-book* and Print. Volume(s) order, please ... *Water* Resources *Management* at the Beginning of thc Twenty-First Century. 3. The Working ... [PDF] on payment basis
17. Wiesmann 2006, Biological Wastewater Treatment - Fundamentals, Microbiology, Ind WileyIntersci

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