

Some Research Areas for Projects and Dissertations:

- Performance study of STPs designed on different treatment technologies such as, ASP, WSP, UASB, Oxidation ditch.
- Decentralized Wastewater Treatment Systems (DTS), reuse of treated sewage
- Resource recovery from STPs to reduce O&M costs- utilisation of treated sewage, manure sludge & biogas recovery for power generation/domestic use etc.
- Nutrient cycle (Nitrogen & Phosphorous) in lakes.
- Oxygen transfer (DO profile) of lakes and its variation, corresponding to organic pollution load.
- Pollution profile of river for a particular stretch (parameters BOD, COD, TSS, DO, FC, Alkalinity).
- Environmental Flow: Minimum flow of rivers Ganga/Yamuna pollution abatement.
- Techno economic comparison of the existing technology vis-a-vis new technologies for waste water treatment to find out most cost effective treatment technology.
- Water Quality modeling for forecasting POPs status in some identified river.
- Evaluation of bioremediation technology used in lake conservation.
- Technologies for reducing pathogens vis-à-vis coliform in water.
- Correlation between application rate of pesticides & fertilizers with their residue in run-off water.

Career Opportunities

Postgraduates of M.Tech in Conservation of rivers and lakes could be employed in Government Departments, various Research Institutes and consulting companies. Career opportunities also exist under various National Schemes of National River Ganga Basin Authority (NRGBA), National River Conservation Plan (NRCP), National Lake Conservation Plan (NLCP) of Ministry of Environment and Forests, 'Jawaharlal Nehru National Urban Renewal Mission' (JNNURM) of Ministry of Urban Development etc.



The Institute

The Indian Institute of Technology Roorkee (IITR) is one of the oldest institutes of technical education. It was established in 1847 as Roorkee College, was rechristened as Thomason College and then became University of Roorkee in 1949. It was declared as an institute of national importance and was converted into IITR in 2001. The Institute has 18 departments of Engineering, Science, Management & Humanities and 10 academic/service/excellence centers carrying out teaching and research and providing consultancy services.

IITR is fully residential in nature and has excellent facilities for students in hostels (called Bhawans), sport and other co-curricular and extracurricular activities. Roorkee is situated about 180 km north of Delhi and is well connected by trains and roads.

About AHEC

Alternate Hydro Energy Centre (AHEC), an academic centre of IIT Roorkee, works for small hydropower development and other renewable energy sources as well as conservation of water bodies.

In addition to teaching and research, AHEC also provides advisory and technical and technical support to national and international institutions for small hydropower development, drainage and conservation of lakes and rivers.

For further information, please contact:

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M.Tech. Conservation of Rivers and Lakes



Indian Institute of Technology, Roorkee
Alternate Hydro Energy Centre
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Background

India is endowed with rich water resources. A 45,000 km long riverine systems criss-crosses the length and breadth of the country. These rivers include Himalayan snow fed rivers, peninsular rain fed rivers and coastal short rapids.

Rapidly increasing population, rising standards of living and exponential growth of industrialization and urbanization have exposed the water resources, in general, and rivers, in particular, to various forms of degradation. Deterioration in water quality of the river impacts the people immediately. Many Indian rivers and lakes, particularly during lean flows, have become unfit even for bathing.

National River Conservation Plan (NRCP) and National Lake Conservation Plan (NLCP) of Ministry of Environment and Forests, Jawaharlal Nehru National Urban Renewal Mission (JNNURM) supports the conservation projects and infrastructural projects in urban areas.

The need to create adequate and properly trained manpower in various scientific, technical, social, economic and administrative aspects of conservation of rivers and lakes in the following areas has long been felt:

- Preparation and implementation of programme/projects/schemes of environmental conservation
- Operation and maintenance of assets created under conservation of water bodies
- Monitoring of environmental status of rivers and lakes

To create trained manpower in the country, the MoEF is supporting an interdisciplinary Master of Technology (M.Tech.) programme in "Conservation

of Rivers and Lakes" at Indian Institute of Technology, Roorkee (IITR) for personnel from Central, State and local governments and their organisations and fresh engineering graduates with GATE qualification. This especially designed M. Tech. programme is being offered since 2004.

M Tech Programme in "Conservation of Rivers and Lakes"



Programme Objective:

The programme aims to develop manpower capable of doing the followings:

- Assess the status of water bodies
- Initiate, plan and execute conservation and management plans
- Evaluate plans and reports and select consultants
- Build capacity to undertake and supervise conservation and restoration of water bodies.

Eligibility and Admission Requirement

(a) For GATE Qualified Candidates

A bachelor's degree in Civil / Electrical / Mechanical / Industrial / Chemical / Agricultural / Environmental Engineering or equivalent with at least 60% marks or a CGPA of 6.0 on a 10 point scale.

OR

Masters in Science with Mathematics at graduation level (limited to 30% of total seats)

(b) For Sponsored Candidates

Educational qualification same as above plus a minimum of 2 years professional experience (GATE scores are not required).

Programme uniqueness:

- Field oriented education projects and dissertation
- Travel to project sites
- Well equipped laboratories
- Faculty and outside experts with rich field experience

Number of Seats: 15 (for GATE qualified candidates) and 10 (for sponsored candidates)

Fellowships : Rs. 8000/- pm for GATE qualified candidates

Course Contents

I semester

- Numerical Analysis, Probability and statistics
- Modeling, Simulation and Computer Application
- Aquatic Ecology
- Integrated Management of water bodies
- Minor Elective
- Technical Communication (Optional)

II Semester (Laboratory Course and 5 electives from following)

- Waste Water Collection, Treatment and Disposal
- Environmental Laws, Public Participation and Institutional Development
- Project Formulation and Implementation
- Coastal Pollution Monitoring and Impact Assessment
- Application of RS and GIS in Environment Management
- Hydrology and Modeling of water bodies
- Planning and Management of Environmental Facility
- Climate Change and water body
- Ground Water Hydrology
- Water Shed Behavior & Conservation Practices
- Urban Hydrology
- Environment Impact Assessment of Civil Engineering Projects
- Hazardous Waste and Risk Management

III Semester

- Seminar
- Project and Site Visits
- Dissertation

IV Semester

- Dissertation

