भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन नदी विकास एवं गंगा संरक्षण विभाग
केन्द्रीय जल आयोग
प्रशिक्षण निदेशालय

सत्यमेव जयते

Government of India
Ministry of Jal Shakti
Dept. of Water Resources, RD & GR
Central Water Commission
Training Directorate

CIRCULAR

Subject: Sponsoring officers for admission to M.Tech programme in "Environment Management of rivers and lakes" from IIT Roorkee for the academic session 2025-26-regd.

It is proposed to nominate CWC officers for the course mentioned under the subject, to be held at IIT Roorkee. Accordingly, it is requested that any interested/suitable eligible officer may apply through proper channel in the prescribed application format so as to reach this office **latest by 22.06.2025** with the approval of the Concerned Member/Chief Engineer (HRM) in respect of HRM Unit/Chief Engineer (NWA) in respect of NWA through concerned Establishment Section of CWC (for verification of eligibility criteria by the concerned Establishment) for taking further necessary action in the matter.

The detailed Information Brochure **(attached)** for admission to M. Tech in Environment Management of rivers and lakes Programme is available on the link **(https://hre.iitr.ac.in/Academics/Post%20Graduate%20Programs.html).**The applicant must have minimum qualification for admission to aforesaid program as mentioned in admission brochure for M. Tech program.

Encl: As Above

Digitally Signed by Sachin Gupta
Date: 11-06-2025 10:26:26
Reason: Approved
(Sachin Gupta)
Deputy Director

Copy to:

1. All Chief Engineers, Central Water Commission (HQ & Field Offices).
2. Director, (D&R/WP&P/RM)-Coordination, CWC, New Delhi.
3. Secretary/Director (TC)/Director (Admn.), CWC, New Delhi.
4. Head, Department of Hydro and Renewable Energy, Indian Institute of Technology Roorkee, Roorkee - 247 667, Uttarakhand. Phone: (+91 1332), 285213 (O), (E-mail: head@hre.iitr.ac.in)
5. CWC Website.

नई लाइब्रेरी बिल्डिंग,
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Conserve Water-Save Life

प्रदीप कुमार अग्रवाल, भा.प्र.से.
Pradeep Kumar Agrawal, IAS
संयुक्त सचिव
Joint Secretary

सत्यमेव जयते

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास एवं गंगा संरक्षण
Government of India
Ministry of Jal Shakti
Department of Water Resources
River Development and Ganga Rejuvenation

D.O. No. J-27011/2/2022-NRCD-II

Dated: 27th May, 2025

Respected Sir,

For addressing environmental degradation of rivers in our country, Department of Water Resources, River Development and Ganga Rejuvenation (D/oWR, RD & GR), Ministry of Jal Shakti is implementing National River Conservation Plan and Namami Gange Programme. These efforts are supplemented by the National Plan for Conservation of Aquatic Eco-systems of Ministry of Environment, Forest and Climate Change and AMRUT & Smart Cities Mission of Ministry of Housing and Urban Affairs.

The holistic conservation of water bodies requires proper assessment of environmental status, conducting surveys and investigations, preparation of DPRs and implementation of the projects. For capacity building of the States/UTs in this field, our Directorate/NRCD, DoWR, RD & GR has sponsored a two-year M. Tech. programme on '***Environmental Management of Rivers and Lakes***' at Indian Institute of Technology Roorkee. This program is presently for capacity building of 5 sponsored candidates from the concerned organizations of different State Governments/UTs/ULBs, especially to identify problems and prepare projects reports for holistic conservation of water bodies in their States/UTs to avail maximum benefit of the schemes.

Different courses under the programme would cover watershed management, pollution assessment, environmental laws and practices, water quality assessment, waste water treatment, industrial and municipal solid waste management, hydrology, project formulation and evaluation, institutional development, etc.

The information brochure for admission to the said Programme commencing from the academic session 2025-26 is available at **https://hre.iitr.ac.in/Academics/Post%20Graduate%20Programs.html**

I would request for nomination of officers under your kind control to attend the programme in the coming academic session starting from July/August, 2025, for which applications should reach online to Indian Institute of Technology Roorkee by June 30, 2025. In case of any difficulties, the Head of Department (HoD), HRED, IIT Roorkee, may be contacted via email at **head@hre.iitr.ac.in** or by phone at **07428-640872**.

Looking forward to your favourable response.

With regards,

Yours sincerely,

(Pradeep Kumar Agrawal)

Shri Atul Jain
Chairman
Central Water Commission
Sewa Bhavan CWC HQ
R.K. Puram Sector 1 New Delhi 110066
Email: chairman-cwc@nic.in; mwp@nic.in

YEARS OF
IIT ROORKEE
Estd. 1847

M.Tech. Programme in
ENVIRONMENTAL MANAGEMENT OF RIVERS AND LAKES

Department of Hydro and Renewable Energy
Indian Institute of Technology Roorkee

CONTENT

IIT ROORKEE: AT A GLANCE

- Established in 1847
- 10000+ Students (21% girls)
- 500+ Faculty members
- 3 campuses
- 365 Acres at Roorkee
- 10 Acres at Gr. Noida
- 25 Acres at Saharanpur
- 26 Departments
- 14 Centers and units
- 250+ international students

- ✓ **Ranked #1 in Architecture, #6 in Engineering and #7 Overall in National Institute Ranking Framework (NIRF) 2022 India**
- ✓ **Ranked #5 in the excellent band in Atal Ranking of Institutions on Innovation Achievements (ARIIA) 2021**
- ✓ **Ranked #400 in the QS World University Rankings 2022**
- ✓ **Ranked #1 in India Today Architecture and #5 in Engineering 2021**
- ✓ **Bagged the first position under the Most Innovative Research Institutions category by the Confederation of Indian Industry (CII) for the year 2020, 2021 And 2022.**
- ✓ **Excellence In Internationalization Of Education By FICCI 2019**
- ✓ **National Gold Award For E-Governance 2021**
- ✓ **Eat Right Campus Award By *FSSAI* 2019, 2022**
- ✓ **IIT Roorkee Bags QUESTEL IP Excellence Award 2022**

NEED FOR THE PROGRAMME

Pollution of surface water bodies is an important area of concerns as human settlement requires fresh water for substance and for domestic and for industrial uses. Large economy of the country is dependent on availability of good quality fresh water resources. In view of this, Govt. of India has focussed on elimination and control of pollution of rivers and lakes caused due to anthropogenic activities in the catchment, rapid urbanisation and industrialisation and launched the Ganga Action Plan (GAP) Phase I in June 1985. Yamuna and Gomti Action Plans were approved under a new scheme of GAP Phase II. This was followed by approval of pollution abatement programmes of other polluted rivers of the country in July 1995 under the National River Conservation Plan.

National River Conservation Plan under Ministry of Jal Shakti covered 80 towns and 36 non Ganga rivers in 16 states up till Dec 2022, 205 towns and 125 towns on 12 rivers in Ganga river basin till July 2014. Ganga basin, from July 2014 onwards is administrated by National Mission for Clean Ganga (NMCG) under the Ministry of Jal Shakti. The various components included under the scheme are laying of sewers, construction of sewage treatment plants, pumping stations, management of solid waste, provision of low-cost toilets and crematoria, shifting of dhobi ghats, improvement of bathing ghats, afforestation along rivers, public participation facilitate in improving the environment within the town.

The need to have adequate and properly trained manpower in the various scientific & technical, social, economic, administrative aspects of conservation of rivers and lakes has long been felt. The Ministry of Jal Shakti, Government of India, have the responsibility of the National River Conservation programmes. Trained manpower is needed, among other items, to:

- Prepare and implement programme/projects /schemes of environmental conservation
- Operate and maintain the assets created under conservation of water bodies
- Monitor the environmental status of rivers and lakes

A M. Tech programme in "Environmental Management of Rivers and Lakes" at Indian the Institute of Technology, Roorkee (IITR) for the officers from Central, State and local governments and their organisations involved in river and lakes conservation programme as well as GATE Qualified candidates were sanctioned by initially Ministry of Environment and Forests in 2004.

The programme is inter-disciplinary in nature and admits GATE qualified candidates along with sponsored candidates.

Since 2010, students from developing countries are admitted under the International Technical and Economic Cooperation (ITEC) programme of Ministry of External affairs, Govt. of India making the programme truly international. The students are exposed to the basic principles of aquatic ecology, integrated water resources management, waste water collection, treatment and disposal, GIS applications in ecological health and carrying capacity assessment of water bodies, climates change and water resources, project formulation and DPR preparation, solid waste management etc. The students work on important and innovative topic(s) through seminar and dissertations. The field visits to physically see the actual systems in the field are also organised to imbibe the practical knowledge.

The qualified students can catalyse the different activities undertaken by Government under National Schemes like National Mission Clean Ganga, National River Conservation Plan (NRCP), National Plan for Conservation of Aquatic Systems (NPCA), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), undertaken by Ministry of Jal Shakti, Ministry of Environment, Forests and Climate Change (MoEFCC), Ministry of Urban Development, Solid Waste Management, Swachh Bharat and Unnat Bharat Abhiyan etc.

Ministry of Jal Shakti has in 2022 sanctioned the financial support for five seats per batch for sponsored candidates from the year 2023-24 onwards to meet the expenditure on institute fee including hostel fee etc. for the sponsored candidates.

This programme will help in developing trained human resources and conduct research in the vital subject area of environmental management of rivers and lakes to cater to the needs of the Afro-Asian Countries, including India, which would promote sustainable development goals of the society. This information brochure provides information about the academic programs, including eligibility for admission and curriculum to which government and private enterprises are invited to sponsor their officers for pursuing academic programs for training at IIT Roorkee.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

HISTORICAL PERSPECTIVE

Indian Institute of Technology Roorkee has its roots in the Roorkee College established in 1847as the first engineering college in India, which was soon rechristened as Thomason College of Civil Engineering in 1854 after its greatest mentor James Thomason. After about 100 years of distinguished services, the college was elevated to University of Roorkee as the first Engineering University of independent India on November 25, 1949. It was converted to IIT on September21, 2001. It has now 23 academic departments/centres offering undergraduate courses in engineering and architecture, dual degree programmes and Integrated Dual Degree courses in M.Sc./Engineering and around 46 postgraduate courses in Engineering, architecture, sciences, computer science & Engineering and business administration besides research programmes at doctoral level. It has three campuses, main campus at Roorkee and other two at Saharanpur and Greater Noida.

IIT Roorkee has a highly qualified faculty of about 455 members who are engaged in research and consultancy in addition to teaching. The faculty members offer their expertise through consultancy services to private/public sector industries as well as to Government agencies. The institute has about 4159 undergraduate students, 1679 postgraduates and over 2475 research scholars.

A number of academic and research centres are engaged in interdisciplinary research, and many collaborative programmes exist with institutions in India and abroad. Several central facilities exist such as Mahatma Gandhi Central Library having more than 4.00 Lakh volumes of books and periodicals, Information Superhighway Centre with Internet connectivity, an Educational Multi-Media Research Centre with full-fledged television studio, a modern Computer Centre and Institute Instrumentation Centre with highly sophisticated analytical instruments.

IIT Roorkee is fully residential, with well-designed Bhawans (hostels) both for boys and girls, sprawling sports ground, hobbies club, Hospital, a modern swimming pool, boat club and a host of

facilities for different games including Tennis, Squash and Billiards. Societies and Associations along with activities like NCC, Rangering and Rovering, Mountaineering and Trekking provide excellent opportunities for self-development.

Apart from the IIT Roorkee, Roorkee town also has Central Building Research Institute, National Institute of Hydrology, Irrigation Research Institute, Irrigation Design Organization, Headquarters of Bengal Engineering Group & Centre along with an important Army base.

Ph.D. programmes are available in all Departments/Centres. Besides admission to GATE qualified candidate's admissions are also offered to in service candidates under sponsored category.

DEPARMENT OF HYDRO AND RENEWABLE ENERGY (HRED)

Department of Hydro and Renewable Energy (HRED) (Formerly Alternate Hydro Energy Centre) was set up at Indian Institute of Technology, Roorkee in the Year 1982 to promote power generation through the development of small hydro power in conjunction with other renewable energy sources. M.Tech programme in Environmental Management of Rivers and Lakes initially sponsored by Ministry of Environment, Forest and Climate Change, Govt. of India is offered since 2004 for capacity building in the area of conservation, restoration and maintenance of water bodies like rivers and lakes.

LABORATORIES

The Department has its laboratories for experimental work associated with classroom teaching, training, and faculty research and consultancy. In addition to departmental laboratories, excellent laboratory facilities are also available in the Departments of Civil, Electrical, Hydrology, Mechanical, Earthquake Engineering, Earth Sciences and institute instrumentation centre etc.

Environmental Laboratory: Water testing facilities for physico-chemical and bacteriological analysis of water and waste water. Eco-sounder for bathymetry of rivers and lakes, multi parametric analysis kit, Gas Chromatograph etc.

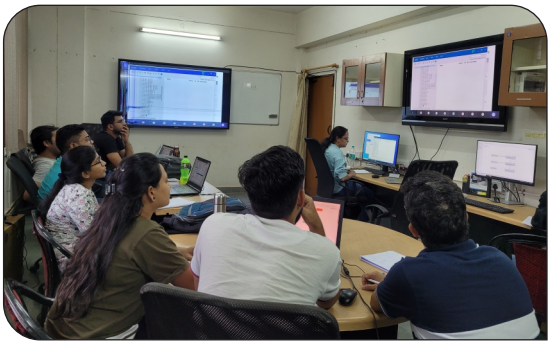
Biofuel Research Laboratory: Facilities for carrying out the R&D in the area of biofuel production with reference to biodiesel production and utilization. Gas chromatograph, Cloud & Pour Point apparatus, digital viscometer, Bomb calorimeter, flash point apparatus etc. are available to analyse the characteristics of liquid fuels.

Instrumentation Lab: Discharge measurement, different types of instruments for discharge in open/ pipes for water & waste water, measurement of silt and its particle size measurement.

GIS Lab: Software for GIS based mapping of Rivers, Lakes and other water bodies are available (ArcGIS, EDAS).

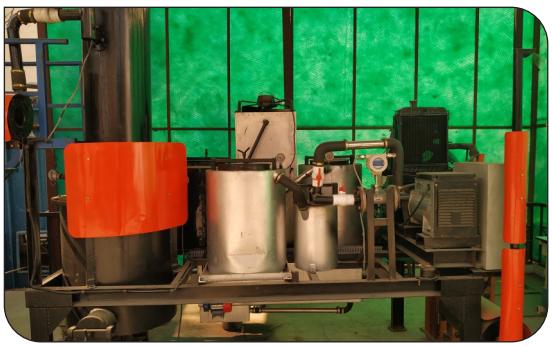
Solar Energy: Testing facility for the SPV and solar thermal energy systems and their integration with STPs/ETPs for power supplementation.

Renewable Energy R&D Lab: Facilities to carry out experimental work in the area of Renewable Energy.



Energy Systems Modelling lab: High end simulation softwares for Integrated assessment modelling, life cycle assessment and process simulation & optimization.

Biomass Energy Processes lab: Thermo-chemical conversion of biomass feedstocks for possible conversion to synthesis gas, bio-char and electricity



SPONSORED RESEARCH/ CONSULTANCY PROJECTS

HRED is the well known nationally for its vibrant and dynamic participation in the area of environmental managmenet of water bodies. It has carried out a number sopnsored researchand consultancy projects and provided expert services to various central and stateorganizations. In view of the expertise of faculty and collaborative work with other departments, national and international organisations, expert services were provided on large number of nationally important projects of central, state government and international organisations. Some of these projects have been undertaken for the first time being unique in nature. The major contributions of HRED are given below:

Sponsored by Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India:

- **Prepared Guidelines for Preparation of DPRs for Works of Interception and Diversion of Drains and Sewage Treatment Plants for** National Mission for Clean Ganga, Ministry of Water Resources, River Development &Ganga Rejuvenation (2018)
- **Preparation of Guidelines for National Plan for Conservation of Aquatic EcoSystem (NPCA**) (2019)
- **Environment Status Paper on River Ganga** (2009 and 2014-15)
- **Guidelines for Preparation of Project Reports under National River Conservation Plan and National Ganga River Basin Authority (20**10)
- **Water Quality Monitoring Programme under National River Conservation Programme**: (Rs 2009-10)
- **DPR for Conservation and Management Plan of Nainital Lake and Other Four Lakes: -** Detailed Investigation and to identify causes and sources of pollution of Nainital Lake and 4 lakes in District Nainital and suggesting possible measures for Management and Conservation of Lake. (2002 – 03).
- **Preparation of DPR for Conservation & Management Plan Dal-Nagin Lake in J&K for IML 1980M: -** Detailed Investigations to identify causes and sources of pollution of Dal Lake and suggest possible mitigation measures including assessment, data collection, engineering, designs, cost estimates, specification for Management and Conservation of Lake. (1999 – 2001)
- **Preparation of Detailed Guidelines of NRCD for preparing the proposal for 11th plan:** (2001 – 02)
- **Performance Evaluation of Works Carried under Yamuna Action Plan: (**2001 – 02)
- **Cumulative Environment Impact of Hydropower Projects in Alaknanda and Bhagirathi Basins** (2009-10)
- **Techno Economic Appraisal of DPRs on Pollution Abatement Submitted by State Governments:** UP (42), Haryana (2), Delhi (08), Bihar (21), Jharkhand (46), Maharashtra (3), West Bengal (6) and Uttarakhand (22Nos.), Jammu Kashmir (5 nos.)
- **Techno economic appraisal of DPRs on Conservation and Management Plan of Lakes submitted by state governments:**
- **Contributed as Lead Author to the report of Working Group on Impacts of Desilting on Reservoirs and Barrages, Ministry of Environment, Forest, and Climate Change 2020**

- **Contributed as Lead Author for Guidelines for Maintaining Longitudinal Connectivity Through Dams, Central Water Commission, 2017**

Sponsored by State Governments:

- **Cumulative Environment Impact Assessment of Hydropower Projects** in Satluj River (2012-19)
- **Cumulative Environment Impact Assessment of Hydropower Projects** on River Alaknanda and Bhagirathi and its Tributaries in Uttarakhand (2012-15)
- **Cumulative Environment Impact Assessment of Hydropower Projects** on River Yamuna and Tons & Its Tributaries in Uttarakhand for State Government (2012-15).
- **Carrying capacity** of River Alaknanda and Bhagirathi basin for State Government (2017-19)
- Preparation of DPR for using **Hydro Potential on Water Supply and Waste Water Treatment Plants in Delhi** for Delhi Jal Board (2016-17).
- **Preparation of DPRs for conservation and management of Gadisar and Kaylana Lake** in Rajasthan for state government (2010 – 13)
- **Techno economic appraisal of 9 DPRs for conservation and management of lakes in Rajasthan** (during 2011 – 14)
- **Conservation and Management of River Kshipra for Ujjain Municipality, MP: -** River Kshipra is deficient in water availability during Dec – June. The water quality at bathing ghats is below the National Standards for water quality for bathing. Plans have been prepared for conserving, storing and bringing the water from and outside catchment. (2008-09).
- **Integrated Sewage and Solid Waste Management Plan for Bhubaneswar City for Orissa Water Supply and Sewage Board: -** The project was for integrated management of sewage and solid waste of Bhubaneswar city with over 300 sq km divided into 5 zones project involved strategy for public awareness and participation and repair of existing sewers. The project has been sanctioned under JNNURM, MOUD. (2004 – 06)
- **Identification of Sources for Irrigation, Drinking Water and SHP for Darjeeling Planter's Association and Tea Board: -** Includes identification and estimation of water sources for irrigation, drinking water and hydro power generation for tea gardens in Darjeeling area for better productivity. (1997-99).

International Collaborative Projects

- **EU funded Research project:** Development of an Assessment system to Evaluate the Ecological Status of Rivers in the HKH Region for EU/Union of Vienna, Austria (collaborative with 5 Asian and 4 European countries): - Development of assessment system for evaluation of water quality and ecological status of the rivers in HKH Region. (Rs. 5.8 million during 2005 –08).
- **Development of flow regime estimation model** for hydropower estimation in Uttarakhand –Centre for Ecology and Hydrology (CEH), UK (Rs. 2.2 Million during 2016-18)
- **DST funded Indo-Hangarian Project:** "Waste algae to biogas for clean energy and environment: techno-environ-economic prospects" with 4 insitutions (IIT Roorkee, IIT Delhi from India, and Uiverisy of Debrecen, University of Pannonia from Hungary). The project is developed to utlize the waste algae in water bodies for energy recovry and possible reduction in GHG emissions from water bodies (2020 – 22)

- **CNRS International Emerging Actions (IEA), France sponsored** project entitled "Development of energy-water-air nexus framework for wastewater treatment (NEWAIR)" in collaboration with Laboratoire Image Ville Environnement, Centre National de la Recherche Scientifique (CNRS) and University of Strasbourg, France. The project aims to evaluate the feasibility of net positive energy wastewater treatment while providing reduced air pollutant emissions (2023 - 24)

INTERNATIONAL AND NATIONAL SHORT-TERM TRAINING PROGRAMMES

- Organizing National programme of 1-2 weeks duration for professionals/fields engineers working in the area of environmental management of water bodies since the last 17 years. 186 programme were organized & 34000 participants small hydropower since last 19 years. So far 266 programmes were organized & 4227 participants were trained.
- Organizing International training courses of 1-2 weeks duration for participants drawn from developing countries since the last 19 years. About 62 programmes were organized and 1387 participants from 87 countries were imparted training.

AREAS OF EXPERTISE AND RESEARCH AREAS

1. **Environmental Management of Water Bodies:**
    - Conservation and management plans of lakes
    - Bathymetric investigation
    - Cleaning and control of eutrophication in water bodies,
    - Ghat Development
    - Water quality assessment mapping and profiling,
    - Ecological health assessment of water bodies,
    - Biomonitoring of rivers and lakes,
    - Point and non-point source of pollution in water bodies
    - Development and evaluation of sewage schemes STPs/ETPs
    - Eco-restoration of rivers and lakes
    - Ecological health and assimilative capacity of rivers and lakes.
2. **Greenhouse gases (GHG) emission and mitigation**
    - GHG Emissions from Hydropower Reservoir
    - GHG emission from ponds and rivers
    - GHG emission from STP practices
    - GHG emission from municipal solid wastes dump sites/landfills
3. **Wastewater treatment and recycling**
    - Studies related to STPs for performance optimization
    - Biological treatment systems of wastewater: ASP, UASB SBR etc.,
    - Enzymes and microorganisms for wastewater treatment including agricultural runoff

- Nature-based technologies for wastewater treatment: constructed wetlands, algae mediated treatment and hydroponics
- Wastewater treatment and aquifer recharge
- Decentralized sewage treatment system for a rural and urban community
- Heavy metal remediation from industrial effluents and ground water
- Biochar applications in wastewater treatment and soil remediation

4. Biofuel and Bioenergy

- Biodiesel from waste cooking oil and algal lipids
- Bioethanol from algal biomass
- Biogas gas production from organic waste including algal biomass, sewage sludge, food waste and dry leaves
- Bio-oil from algal biomass through Hydro Thermal Liquefaction

5. Resource recovery and circular economy

- Wastewater recycling for nutrient and micronutrient recovery
- Energy recovery from wastewater
- Coproduction of valuable metabolites through microbial integration in WWT
- Resource recovery and valorization of effluent from compressed biogas plants
- Reverse osmosis rejects water treatment and recycling

6. Techno-environ-economic assessment in environmental management

- Life cycle assessment (LCA) of wastewater treatment plants.
- Application of techno-ecological synergy
- Modelling and simulation of wastewater treatment pathways
- Multi-objective optimization of wastewater treatment pathways
- Application of GIS for LCA studies
- City sanitation plants
- EIA and CEIA of development projects

M.TECH. PROGRAMME IN ENVIRONMENTAL MANAGEMENT OF RIVERS AND LAKES

TEACHING SCHEME

The M.Tech programme consists of two semester teaching, practical work and seminar and another two semester for working for thesis on special problems related to water bodies conversation and management. The teaching includes lectures, and laboratory work. The lectures are supplemented by tutorials and through the writing of concept/review papers. The course has been framed to provide up-to-date knowledge of basic principles of the subjects. The student can select subject in each semester (I and II) of their choice depending upon their background & requirements. Each course (subject) has several credits, which depend on the academic load and weekly contact hours for Lectures (L), Tutorial (T), and Practical (P). One credit is normally assigned to one hour of lecture or one hour of tutorial, or two hours of practical per week, and distribution is expressed as (L-T-P).

Program Code: **13**
Title: **M.TECH. (ENVIRONMENTAL MANAGEMENT OF RIVERS AND LAKES)**
Department**:** **Department of Hydro and Renewable Energy**

Year**:** **First**							
Teaching Scheme					**Contact Hours/Week**		
S. No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**
Semester- I (Autumn)							
1.	HRE-523	Integrated Management of water bodies	PCC	4	3	1	2/2
2.	HRE-525	Aquatic Ecology	PCC	4	3	1	2/2
3.	HRE-544	Project Formulation and Implementation	PCC	4	3	1	-
4.		Programme Elective Course-I**	PEC	4	-	-	-
5.		Programme Elective Course-II*	PEC	4	-	-	-
		Total		20	9	3	2
Semester-II (Spring)							
1.	HRE-527	Laboratory Course	PCC	2	-	-	3
2.	HRE-554	Waste Water Collection, Treatment and Disposal	PCC	4	3	1	-
3.	HRE-700	Seminar	SEM	2	-	-	-
4.		Programme Elective Course-III**	PEC	4	-	-	-
5.		Programme Elective Course-IV**	PEC	4	-	-	-
		Total		16	3	1	3
Year**:** **Second**							
Semester- III (Autumn)							
1.	HRE-701A	Dissertation Stage–I (to be continued in next semester)	DIS	12	-	-	-
		Total		12			
Note: Students can take 1 or 2 audit courses as advised by the supervisor, if required.							

Teaching Scheme					Contact Hours/Week		
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P
Semester-IV (Spring)							
1.	HRE-701B	Dissertation Stage–II (contd. From III semester)	DIS	18	-	-	-
		Total		18			

Summary				
Semester	1	2	3	4
Semester-wise Total Credits	20	16	12	18
Total Credits	66			

**Program Elective Courses (EMRL)

Teaching Scheme					Contact Hours/Week		
S. No.	Subject Code	Course Title	Subject Area	Credits	L	T	P
1.	HRE-517 B	Modeling, Simulation and Computer Application	PEC	4	3	1	2/2
2.	HRE-518	Environmental Planning and Management	PEC	4	3	1	-
3.	HRE-540	Solar Photo-Voltaic Design and Application	PEC	4	3	1	-
4.	HRE-542	Energy Conservation and Management	PEC	4	3	1	-
5.	HRE-550	Application of RS & GIS in Environment Management	PEC	4	3	1	-
6.	HRE-552	Hydrology and Modeling of water bodies	PEC	4	3	1	-
7.	HRE-556	Environmental Laws, Public Participation and Institutional Development	PEC	4	3	1	-
8.	HRE-558	Coastal Pollution Monitoring and Impact Assessment	PEC	4	3	1	-
9.	HRE-576	Planning and Management of Environmental Facility	PEC	4	3	1	-
10	HRE-580	Climate Change and water bodies	PEC	4	3	1	-
11	CE-605	Solid Waste Management	PEC	4	3	1	-
12	CE-604	Environment Impact & Risk Assessment	PEC	4	3	1	-
13	CE-603	Industrial and Hazardous Waste Management	PEC	4	3	1	-
14	HY-527	Ground Water Hydrology	PEC	4	3	1	-
15	HY-531	Water Shed Behavior& Conservation Practices	PEC	4	3	1	-
16	HY-542	Urban Hydrology	PEC	4	3	1	-
17	HRE-581	Energy-Water-Food Nexus	PEC	4	3	1	-

L= Lecture, T= Tutorial, P= Practical, CWS= Class Work Sessional, PRS = Practical Sessional, MTE= Mid Term Examination, ETE= End Term Examination, PRE = Practical Examination, ICC= Institute Core Course, PCC= Programme Core Course, OEC= Open Elective Course, PEC= Programme Elective Course

FIELD TRIPS

The field trips are organized to rivers and lakes conservation facilities in order to acquaint the students with various problems encountered at project sites.

BROAD TOPICS SUBJECTS OFFERED IN THE PROGRAMME

Medium of Instruction The medium of instruction in the Department is English. Trainee officers are expected to have sufficient working knowledge of the English language.

Subject Title	Broad Topics	Highlights
Programme Compulsory Courses (PCCs)		
Integrated Management of water bodies **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1, Practical: 2/2**	Hydrology, types, hydrological processes and water balance of water bodies; Point and non-point sources; Water quality indices and methods for water quality assessment; Legal and institutional arrangement for the management of water quality and quantity; Application of remote sensing and GIS for water management;	Integrated management of water bodies, water quality assessment, legal & institutional arrangements, application of RS & GIS for water management
Aquatic Ecology **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1, Practical: 2/2**	Definition, relevance, principles and scope of ecology; Concept, importance and conservation of aquatic biodiversity; Ecosystem models; Pollution of lakes and rivers; Eutrophication; Restoration methods; National/international perspectives; Elementary biochemistry; Microorganism in environment;	The basic knowledge about the ecological processes operating at ecosystem levels and their relations with man-made ecosystem
Project Formulation and Implementation **Credit: 4 Contact Hours: Lecture : 3, Tutorial: 1**	Project objectives and formulation; Preparation of different project reports; Project implementation and management methods; Project planning; Tendering procedures; Economic and financial analysis; Financial management; time management and sustainability, Regulations/statuary acts;	The components for preparing project reports/DPRs, its planning & financial aspects together with time management and sustainability of projects.
Laboratory Course **Credit: 2 Contact Hours: Lecture: 0, Tutorial: 0, Practical: 3**	Solid waste characterization; Performance evaluation of sewage and effluent treatment plants, toilets, crematoria; Flow measurement techniques; Sediment analysis; Trace element analysis;	Impacts practical knowledge about the methods for water and waste water analysis in the lakes through different modules
Waste Water Collection, Treatment and Disposal **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1**	Sources and quality of waste water; Effluent standards; Measurement and analysis of waste water flow; Waste water collection, sewerage systems, sewage pumping and disposal; Typical sewage quality and its composition; Software for sewer design and estimation of waste water; Methods and implementation strategy of treatment processes; Operation and maintenance of waste water treatment plants; Treatment of sludge, disposal of treated effluent and sludge; Resource generation; CDM of conservation facilities;	Introduces the water and waste water characteristics, estimation of water demand, waste water estimation, general features and O&P of different types of STs/ETPs, use of treated effluents/ sludge, resource generation etc for sustainable development.

Subject Title	Broad Topics	Highlights
Programme Elective Courses (PECs)		
Modelling, Simulation and Computer Application **Credit: 4** **Contact Hours: Lecture: 3, Tutorial: 1, Practical: 2/2**	Review of C++; System modelling and simulation; Design of experiment and optimization; Water quality modelling, assimilation capacity, dispersion of pollutants in water bodies; Lab on Software development for planning and designing of sewage and effluent treatment plant	Modelling& Simulation of air, water and ocean ecosystem
Environmental Planning and Management **Credit: 4** **Contact Hours: Lecture: 3, Tutorial: 1,**	Basic ecological principles, concept and components of ecosystem; energy flow, nutrient cycling, cybernetics, ecological regulating, ecological diversity; Interaction of various components of environment; Environmental impact assessment (EIA) of renewable energy projects; Environmental policies, laws and acts; Case studies of large and small hydro projects;	Use of EIA as a planning tool with respect to environmental conservation and sustainable development
Solar Photovoltaic Design and Application	Estimation of solar energy; Principle, characteristics and types of solar photo-voltaic (PV) cell; Manufacturing and performance testing of solar PV modules; Components of PV system; Sizing of PV system; Isolated and grid connected PV power plants; Economic analysis;	SPV design for energising on remote area in off grid/grid connected mode and integration with STPs/ ETPs.
Energy Conservation and Management **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Definition of energy conservation and management; Principles, types, procedures and instruments for energy auditing; Assessments of technical merits of energy conservation methods; Supply and demand side management; Energy conservation in steam boilers, engines; principles, types and applications of different heat recovery systems; Energy conservation in electrical motors, transformers and conductors; Material conservation and recycling; Topping and bottoming cogeneration cycles, total energy systems;	Energy savings and energy efficiency in various energy consumption sectors including ETPs/STPs and other conservation technologies
Application of RS & GIS in Environment Management **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1**	remote sensing system, sensors and their characteristics; Image processing software; Definition and components of GIS; Spatial and non-spatial data; Applications of RS and GIS in optimal routing of solid wastes collection system and sustainable land use urban development planning; Groundwater vulnerability modelling using GIS;	Application of RS & GIS for preparing city sanitation plant evaluating the productivities / health of different ecosystems.
Hydrology and Modelling of water bodies **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1**	Definition, importance, practical applications of hydrology; hydrologic cycles; evaporation, infiltration, runoffs, catchments, water budget; Hydrograph; Sediment yield and its determination in reservoir/lake; Types of pollutants; mechanisms of transverse and longitudinal mixing;	Assessment of behaviour of water bodies through modelling of hydrology of river & lakes.

Subject Title	Broad Topics	Highlights
Environmental Laws, Public Participation and Institutional Development **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Genesis of environmental acts and main national laws, water act rules, constitution of central and state boards; Environment act rules; National environmental policy, EIA guidelines of MoEF and successive amendments; Environment audit, international protocol; Modes of awareness generation and role of civil society, stages and forms of public participation, role of institutions, evaluation of existing institutions; Case studies;	Knowledge of environmental law is essential to govern the conservation works of rivers & lakes & role of public participation and institutional set up.
Coastal Pollution Monitoring and Impact Assessment **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Fundamental concepts of coastal pollution;Fundamentals of acoustic wave propagation in ocean waters; Water levels and flow measurements; Biological/chemical indicators of coastal pollution, methods for the assessment of coastal and marine pollution; Types, causes and impact of coastal pollution; Notification of coastal regulation zone (CRZ) and environment clearance; Case studies of EIA of developmental projects on coastal areas;	The assessment of pollution of ocean & its impact on the biodiversity of oceans to know its pollution status & impact on services
Planning and Management of Environmental Facility **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Estimation quantities and rates for various works; Drawing up specifications for construction materials; Financial aspects; Fiscal incentives for environmental protection; Measures for sustainability, operation and maintenance of the assets and facilities;	The planning and creation of facility for environmental management of water bodies.
Climate Change and Water bodies **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Natural eco-systems, autotrophs, heterotrophs, energy flows, pre-industrial humanity; efficiency of photosynthesis and ecosystems; Greenhouse gas effect and climatic change problems; Integrated assessment model; Carbon capture and sequestration; Water resources and greenhouse gas emissions, mitigation measures and adaptation to climate change; GHG control, CDM and other emission trading mechanisms; Case studies;	Impact of climate changes, its causes and mitigation measures related to water bodies.
Industrial and Hazardous Waste Management **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	The estimation, collection, characterisation and disposal of industrial and hazardous wastes like e-wastes, hospital wastes, battery wastes, plastic wastes, biomedical wastes and other such wastes, the existing environmental laws / policies for their disposal in the environment and their health effect on the environment and health of biological life.	Management of different types of solid wastes like municipal, industrial, hazardous, biomedical wastes.
Environment Impact & Risk Assessment **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Impacts of hazardous wastes on the environment and assessment of risks associated with their generation/ disposal and mitigation there of.	Risk assessment and risk management with reference to disaster management

Subject Title	Broad Topics	Highlights
Solid Waste Management **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	The collection transportation, suggestion and final disposal of MSW for the generation of resources/ energy /bio-resources is mainly dealt.	Management of MSW for energy and by- products generation
Ground Water Hydrology **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Aquatic ecosystem; Laws of groundwater movement & well hydraulics; Different types of aquifers; Methods of artificial groundwater recharge; Groundwater Management, Assessment & Balancing; Seawater intrusion in coastal aquifers; Ground water Modelling; Formulation of rainwater harvesting and incentives; Institutional framework to prevent over exploitation of ground water; Ground water contamination and remediation techniques;	Water extraction, its impact on quantity and water quality.
Watershed Behaviour & Conservation Practices **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Watershed behaviour, effects of land use changes on hydrological cycle component; Concept of vegetative management of water yield and quality; Watershed experiments; Inventory techniques for precipitation runoff, soil timber, range-land and wild life; Water harvesting techniques; Estimation of peak runoff rate; Erosion process; Conservative practices, land and soil classification, identification of critical areas;	The estimation of flow of nutrients and run-offs from the catchment and its management
Urban Hydrology **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1,**	Process of urbanization and influence on hydrologic cycle; Rainfall analysis in Urban environment; Urban Runoff computations; Urban drainage; Urban water supply; Introduction to urban watershed softwares; Water conservation and ecological aspects; Water harvesting;	Impact of hydro resources on the urban areas
Energy-Water-Food Nexus **Credit: 4 Contact Hours: Lecture: 3, Tutorial: 1**	Energy, water, food (E-W-F) and Sustainable Development Goals (SDGs); Global and Indian energy, water, and food scenario; Transdisciplinary approach towards nexus; Need to understand the interdependencies and interrelationships between the three resources, Energy market; Energy sources and applications; Energy policies; Energy-Water interactions; Energy-Food interactions; Role of Renewables; Challenges and opportunities, Water sources and applications; Virtual water, and water footprint; Water-Food interactions; Water security and policies; Challenges and opportunities, Food dependence on water and energy; Industrialization of the agri-food system; Challenges and opportunities in context of water and energy sectors; Case studies in food production and processing industry, Methods and models for E-W-F nexus; Multi-criteria decision making and Sustainability analysis methods; Complexity and Uncertainty; Resource management; E-W-F nexus at local and regional levels; Sustainable practices for water and energy consumption,	Nexus between Energy, water, food and Sustainable Development Goals

Subject Title	Broad Topics	Highlights
	Practical methodological implications of nexus; Role of technology in the nexus; Impact of nexus on economy, environment, policies, and community engagement, Interdisciplinary case studies – Formulation and analysis (Exercise/Project activity); Climate change and nexus; Agriculture and nexus; Opportunities for business and innovation	

NUMBER OF SEATS

Total number of seats under this programme is as follows:

a)	Regular GATE qualified	13 Nos.
b)	Candidates sponsored by Indian/State Govt. agencies / MoJS Fellowships	05 Nos.
c)	Foreign participants (ITEC programme and other scheme of Govt. of India or nominating country)	05 Nos.

FEES AND EXPENSES

The Institute fees and estimated expenses for the course are available at the Institute website under PG admissions.

ELIGIBILITY FOR ADMISSION

These essential eligibility requirements are applicable to all categories of candidates, viz; regular, sponsored and foreign candidates.

a) Sponsored Indian Nationals

A recognized degree in **Civil / Electrical / Mechanical / Industrial / Chemical / Agricultural / Environmental Engineering / Architecture / planning / Biotechnology** or equivalent with at least 60% marks or a CGPA of 6.00 on a 10-point scale at the Bachelor's level with two years' work experience.

Master in Science with Mathematics at graduation level with at least 60% marks or a CGPA of 6.00 on a 10-point scale are eligible for the admission under this programme.

The full-time sponsored candidates must have a minimum of two years of full-time work experience in responsible capacity in a Registered firm / Company / Industry / Educational and Research institution/Govt./ Quasi govt. Autonomous Organisation in the relevant field in which admission is being sought. The Firm/ Company/Industry shall either be a public sector undertaking or a public limited undertaking registered in a stock exchange or a private concern whose annual turn-over during the past two years exceeds Rs. 5 crores. The educational institutions should be recognized by AICTE.

Candidates must submit the sponsorship certificate duly signed by the Head of the Institution / Organisation on the prescribed proforma at the time of counselling. A few candidates may also be admitted under QIP and Defence Research & Development Organisation (DRDO) Schemes, for which admission procedure is separate. For further details, Assistant Registrar (Academic), Indian Institute of Technology, Roorkee - 247 667 may be contacted or visit institute website for admission.

The candidates working in Govt./ Semi Govt. / PSU organizations are only eligible to apply through this information brochure. Other candidates can apply through the advertisement released by PG Admission office in the month of March every year.

b) Foreign Nationals and non-resident Indians

For M.Tech. programme, the candidates should have (i) A bachelor's degree in the one of the disciplines mentioned above at (a), with a minimum grade point average of 6.00 on 10-point scale or 60% marks in aggregate with two years' experience in relevant field. The candidates can be admitted under ITEC programme and other programmes of Ministry of External Affairs (MEA), Govt. of India.

Non sponsored foreign nationals may also apply for admission to M.Tech programme, subject to qualified GATE only through their embassy in India or Indian mission (embassy/high commission) in their country.

c) For Regular 'GATE' Qualified Candidates

GATE qualified with the qualifications mentioned above at (a).

FINANCIAL INCENTIVES/OBLIGATIONS

(For Indian Nationals Sponsored by Central / State Government and their Agencies)

The following expenditure would be met by the IITR out of the sponsorship amount to be received the National River Conservation Development (NRCD), Ministry of Jal Shakti.

- Tuition fee and statutory deposits about Rs 1.5 lakh for the programme
- Hostel fee @ Rs. 2,500/- pm
- A monthly allowance of Rs. 4,000/- shall be paid to each candidate. This will be in addition to the salary and allowances that the candidate's parent organization will be paying to the candidate.
- A onetime book expenditure (on approval from faculty supervisor) up to Rs. 5,000/- will be reimbursed to each candidate.

(a) Other items

- Mess and other dues will be borne by the candidates directly.
- Hostel/Mess and other facilities will be available as for other candidates of the Institute.
- Married accommodation will be provided only, if available, for which additional charges may be levied.
- The candidates will be entitled to medical facilities as admissible to other M. Tech. students of IITR.

(b) Foreign Students and scholarships

The procedure is described below for each type of sponsored candidates:

Foreign candidates seeking admission to postgraduate course should apply through the Govt. of India, if they wish to come through any Govt. supported programmes such as International

Technical and Economic Cooperation (ITEC) and Cultural Exchange Programmes or through Educational Consultants (India) Ltd., New Delhi or any such government schemes. They may seek necessary help from the Indian Embassy in their country or their Embassy in India. Interested persons may visit their web sites www.itec.nic.in and http://www.iccrindia.net/students.html

(c) At the cost of Sponsoring Governments

Applications of candidates sponsored by foreign governments at their own cost may be made in the prescribed form and forwarded through the Embassies/ Missions of India to the Head, Department of Hydro and Renewable Energy, Indian Institute of Technology, Roorkee - 247 667 India.

(d) GATE qualified (with Institute Assistance ship and Self-financed)

The fee and other financial obligations are to be paid/met directly by the candidates as given separately under 4.0.

PROCEDURE FOR ADMISSION

a) Indian students

The GATE qualified candidates may visit institute website in March/ April and apply on the prescribed application form to Chairman, PG Admission, IIT Roorkee.

b) Indian sponsored students

The Indian Sponsored Candidates from Govt. Departments should apply through their employer. The application form may be downloaded from Website (https://hre.iitr.ac.in) or using the copy of the application form appended with this brochure.

Completed applications should be forwarded to Head, Department of Hydro and Renewable Energy, IIT Roorkee-247667, Uttarakhand, India and should reach the department on or before May 31.

Following enclosures should be attached with the application form:

(i) Two recent passport size photographs with name written at the back of the photographs.

(ii) Copies of academic transcripts giving the proof of aggregate percentage of marks/CGPA obtained. Attach attested copies in English language (translated version, if the original language is different). For M.Sc. degree holders, a certificate/mark sheet must be attached indicating the subjects offered in the B.Sc. course.

c) Foreign Students

Foreign candidates may apply in Govt. of India, supported programmes such as International Technical and Economic Cooperation (ITEC) Programme of Govt. of India through proper channel. The candidates may visit website (www.itecgoi.in).

Foreign candidates are required to undergo medical examination as per medical rules prescribed by the Central Government for foreign students and have to undergo test for HIV at National Institute of Communicable Diseases (NICD), Delhi within one month of their

admission. The admission of foreign candidates would be confirmed only after medical examination and the test report regarding HIV.

Non sponsored foreign nationals may also apply for admission to M.Tech programme, subject to qualified GATE only through their embassy in India or Indian Embassy in their country.

CLASSROOMS/LECTURES, THEATRES AND SEMINAR ROOMS

The Department has spacious and well-ventilated classrooms and lecture theatres for regular classes. These rooms are well equipped with overhead projector, multimedia projection etc.

MEDIUM OF INSTRUCTION

The medium of instruction at the Institute is English. The foreign students are therefore, required to have adequate working knowledge of English language.

LODGING AND BOARDING

The Khosla International House (KIH), its Azad Wing, Himgiri Apartment and A. N. Khosla Bhawan provide non-AC accommodation (with attached bathroom and a balcony) for the sponsored married officer trainees of this department. Some rooms are equipped with a kitchenette. A common mess in the KIH (formerly known as Asian African Hostel) caters to Indian and Continental cuisine.

Other Facilities: The facilities such as PG students club, Multi-Activity Centre, sports complex, swimming pool, and cinema hall of the IIT Roorkee can be availed by the trainee officers. Facilities of a well-equipped Hospital, Dairy, Bakery, and Coffee shops are available in the campus. A post office and the branches of State Bank of India & Punjab National Bank are also located within the campus. A computerized center for the reservation of railway tickets is available in the campus.

CAMPUS LIFE

Life at an IIT is always great, but at IIT Roorkee, it's a special blend of modern life and traditional values. What really pumps through the veins of its lifestyle is enthusiasm. It is the enthusiasm that brings every single student to venture new grounds and talents, and the campus does not fall short in providing a platform anywhere. Be it high-tech hostels, sports, arts, coding or even cultural, technical, entrepreneurship events, an exciting level of exposure is received by every student. This driving zeal to be so much more than just having an academic feather in the hat is what saturates the air.

For more details on student hostels, clubs, sports, Group and other facilities visit at https://iitr.ac.in/Campus%20Life/index.html

EVENTS AT IIT ROORKEE

Thomso and cognizance is the youth festival of Indian Institute of Technology Roorkee recognized as one of the greatest and the grandest youth festivals of India, encompasses in itself lavish history, splendid culture and a profoundly rich heritage of IIT Roorkee. In addition, IIT Roorkee actively

celebrate Yoga day, National Social summit and various forms of student-oriented program. IIT Roorkee has active Himalayan Exploration club-the student's organization of IIT Roorkee pioneering in trekking, mountaineering and adventure sports.

For more details https://www.iitr.ac.in/dosw/pages/gallery.html

INTERNATIONAL RELATIONS OFFICE

From the inception of this institute in 1847, its international character is quite strong. The Institute is committed to international cooperation and has been actively involved in partnering with countries to develop initiatives in the fields of engineering, applied sciences, social science, and management education. To facilitate, assist and help inbound International students and outbound national students in all their academic pursuits, the International Relations Office plays an important role.

For further information, we request you to visit https://ir.iitr.ac.in/

ABOUT ROORKEE CITY

Roorkee, a quiet city of moderate size in the district of Haridwar (Uttarakhand), is located on the banks of the Upper Ganga Canal, which originates at Haridwar. The city is located at Latitude 29 52' N and Longitude 77 53' E above 268 m mean sea level. It is about 30 km south of the Shivalik range of the mighty Himalayas, about 170 km to the north of Delhi and is situated on Amritsar-Howrah main railway line. Roorkee is linked by rail to many important mega cities such as Delhi, Kolkata, Chennai and Mumbai. Roorkee is also well connected by road, being located on the Delhi-Haridwar National Highway (NH 58), and on the Roorkee – Panchkula National Highway (NH 73).

The temperature ranges from 3°C to 20°C in winters (October to March) and from 25°C to 40°C in summers (April to September).

The average annual rainfall is 1100 mm and bulk of it occurs from mid-June to September. Apart from the Institute, which is situated in a 150-hectare campus, Roorkee town is an important centre of engineering activities. It has Central Building Research Institute, National Institute of Hydrology, Irrigation Research Institute, Irrigation Design Organization, Headquarters of Bengal Engineering Group & Centre along with an important army base.

NEAREST BUS STATION/ RAILWAY STATION/ AIRPORTS

The Institute is located only 200 m away from Roorkee Bus Station and 2.5 km from Roorkee Railway Station. The nearest international airport is Indira Gandhi International Airport, New Delhi (approx. 200 km) and domestic airport is Jolly Grant Airport, Dehradun (approx. 65 km).

SUBMISSION OF APPLICATION

Application should be submitted in the prescribed form (available in this brochure) completed in all respects and duly endorsed by the employing organization/government. The completed application may be sent to:

Head, Department of Hydro and Renewable Energy,
Indian Institute of Technology Roorkee,
Roorkee - 247 667, Uttarakhand
Phone: (+91 1332), 285213 (O),
E-mail: head@hre.iitr.ac.in

HOW TO APPLY

Candidates are admitted in three categories:

1. Government/Semi Government/PSU Sponsored Candidates from India.
   - Candidates should apply through this Information brochure (Format for the application form is appended)
   - Link to download the application form: https://hre.iitr.ac.in/
2. Sponsored candidates from foreign countries
   - Candidates should apply through IR Portal of IIT Roorkee: https://ir.iitr.ac.in/
3. Fresh undergraduates with GATE
   - Candidates should apply through the website of IIT Roorkee
   - Website Link: https://iitr.ac.in/Academics/Admission.html

Last date for submission of application form: May 31 each year.

Processing of applications for admission and sponsorship takes considerable time, therefore, the sponsored candidates should send their application well in time so as to reach the department latest by May 31.

The Academic Session will start from July / August each year.

The selected candidates shall be governed by the rules and regulations of Indian Institute of Technology Roorkee (IITR). In case of any dispute in interpretation of these rules or any other matter not covered in the rules and regulations, the decision of the Chairman of the Senate of IIT Roorkee shall be final and binding.

Note: The candidates working in Government/Semi-Government/PSU Organizations ONLY are eligible to apply in the format of application provided in this Information Brochure. The remaining candidates can apply through the advertisement issued by the PG Admission office of IIT Roorkee.

For admission related queries of the international candidates, write to admission.ir@iitr.ac.in

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
Department Of Hydro And Renwable Energy, Roorkee – 247667, India
(*Application Form for Sponsored Candidates only*)

Paste the Attested Photograph

Application Form

Name **(block letters)**

(Mr/Ms*) .....
(Surname) (Middle name) (first name)

Present Address: .....

Tel. (with code) .....

Email: .....

Permanent Address: .....

Tel. (with code) .....

Email: .....

Place/Country of birth ..... Date of birth ..... Citizenship .....

Marital Status*: *Married/U. nmarried*

Proof of proficiency in English (*for foreign students only*): .....

Math at UG Level: Yes / No

A) Academic qualifications (beginning from High School)

College/Institution Name and address	Degree or Examination passed	Year of Passing	Division with % of marks/ Grade Point Av.	Position/ Distinction	Main Subjects

B) Employment Record and Experience:

Name of Department	Position held	Period		Details of work done
		From	To	

Name & Signature of Applicant

NOTE:

1. Applicant should strike off whichever is not applicable.
2. Attach self attested copies of the certificates / degrees.
3. In case of award of grade points, please attach a certificate from the issuing University/Institution explaining the conversion formula for converting grade point average to percentage marks.

C) Recommendations of Sponsoring/Nominating Authority

The undersigned is pleased to sponsor Mr./Ms. ..... who is working in this organization for the last .....years and is presently holding the rank/position of ..... for pursuing the M.Tech. Degree Programme in Environmental Management of Rivers and Lakes at IIT Roorkee in the Department of Hydro and Renewable Energy.

His/Her conduct and character is good.

The Institution/Organization would relieve him/her immediately for joining the above course if selected for admission. The Institution/Organization also agrees to pay all the contingent/expenses stipulated by the Institute. This is further certified that the sponsorship for admission will not be withdrawn midway till the completion of the course.

Place: .....

Date: .....

Signature of Head of the Institution/ Organization with seal

Name: .....

Designation .....

For further information, please write or contact to:

Head
Department of Hydro and Renewable Energy
Indian Institute of Technology Roorkee
Roorkee – 247 667, Uttarakhand
Phone : (+91 1332) 285213 (O)
E-mail : head@hre.iitr.ac.in