



Embassy of India
Ambassade de l'Inde
Abidjan, Côte d'Ivoire
Concurrently accredited to Guinea and Liberia

02308

No. ABI/46/2017

13 Mars 2017

L'Ambassade de l'Inde à Abidjan présente ses compliments au Ministère des Affaires Etrangères de la République de Côte d'Ivoire et a l'honneur de se référer à la Note Verbale N°ABI/8/2017 du 13 janvier 2017 concernant le parrainage des formations en développement des ressources en eau et gestion d'irrigation. Les formations sont :

- 2 years M.Tech Degree
- 1 Year P.G. Diploma/Training Certificate

Une brochure d'information révisée pour l'admission aux programmes d'études supérieures (2017-2018) du développement des ressources en eau et la gestion des eaux d'irrigation du Département du développement et de la gestion des ressources en eau de l'Institut Indien de Technologie (Indian Institute of Technology) de Roorkee (Uttarakhand) a été jointe au courrier.

2. La cher Ministre est prié de diffuser ces informations auprès de toutes les autorités concernées.
3. L'Ambassade de l'Inde à Abidjan saisit cette occasion pour renouveler au Ministère des Affaires Etrangères de la République de Côte d'Ivoire les assurances de sa très haute considération.

**Ministère des Affaires Etrangères,
République de Côte d'Ivoire.**

Copie à :

1. Ministère des Eaux et Forêts,
2. Ministère du Pétrole, de l'Énergie et du Développement des Énergies Renouvelables,
3. Ministère de la Fonction Publique et de la Modernisation de l'Administration,
4. Ministère du Plan et du Développement.

[Traduction Officiouse]

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No. ABI/46/2017

13 March 2017

The Embassy of India in Abidjan presents its compliments to Ministry of Foreign Affairs of the Republic of Cote d'Ivoire and has the honour to refer to Embassy's Note Verbale number No.ABI/8/2017 dated 13 January 2017 regarding Sponsoring officers for admission to **2 year M.Tech Degree or 1 Year P.G. Diploma/Training Certificate** in Water Resources Development and **Irrigation Water Management** programme for the academic session 2017-18. The revised Information Brochure for admission to Post Graduate Programmes (2017-2018) in Water Resources Development (WRD) and Irrigation Water Management (IWM) of the Department of Water Resources Development and Management, Indian Institute of Technology (IIT), Roorkee is attached.

2. The Esteemed Ministry is requested to disseminate this information amongst all the authorities concerned.
3. The Embassy of India in Abidjan avails itself of this opportunity to renew to Ministry of Foreign Affairs of the Republic of Cote d'Ivoire the assurances of its highest consideration.

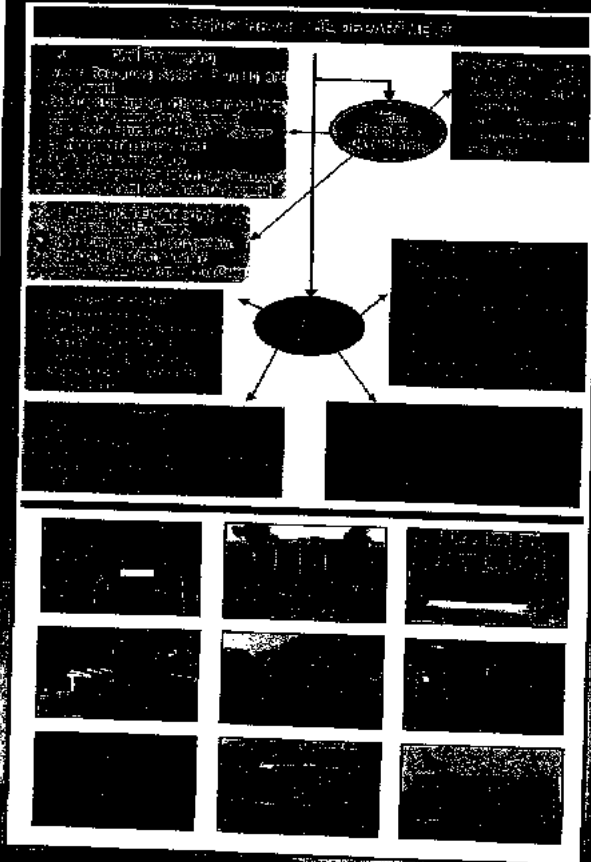


The Director, Department of Asia Pacific Oceania,
Ministry of Foreign Affairs of the Republic of Cote d'Ivoire,
Abidjan.

Copy to:-

1. Ministry of Water & Forests of the Republic of Cote d'Ivoire.
2. Ministry of Petroleum, Energy and Renewable Energy Development of the Republic of Cote d'Ivoire.
3. Ministry of Public Service and Modernization of Administration of the Republic of Cote d'Ivoire.
4. Ministry of Planning & Development of the Republic fo Cote d'Ivoire.

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GOVERNMENT OF PUNJAB
(2017-18)



For Admission to Post Graduate Programmes
in
Water Resources Development & Irrigation Water Management



Department of Agriculture
Government of Punjab

UNIVERSITY OF TECHNOLOGY
ROCKEFELLER
CHENNAI

13/06/2017

Department of
WATER RESOURCES DEVELOPMENT & MANAGEMENT
 Indian Institute of Technology Roorkee



PROF. AJIT K. CHATURVEDI
 Director, IIT Roorkee



Mishra, S.K.
 Professor & Head
 Hydrology, Hydraulics,
 Irrigation Structures,
 Dam Break Analysis



Khare, Deepak
 Professor
 Ground Water, Climate Change
 Water Resources Structures
 Water Resources Management



Kansal, M. L.
 IITRS Chair Professor
 Hydro Power System Planning,
 Water Resource Systems, Operations
 Management, Water Supply Schemes



Pandey, Ashish
 Associate Professor
 Irrigation Management, Remote Sensing
 and GIS Applications in Water Resources
 Management



Chelliah, Thanga Raj
 Assistant Professor
 Application of Power Electronics to
 Hydro-Electric Systems, Control of
 Doubly-Fed Induction Machines



Sharma, Nayan
 Emeritus Fellow
 River Engineering
 Hydraulic Structures and Irrigation



Shukla, S.K.
 Adjunct Professor
 Construction Engineering and Technology
 Project Management
 Supply Chain Management



Singh, R.D.
 Adjunct Professor
 Hydrological Modelling,
 Flood Management,
 Climate Change



Sarma, S.V. Appa
 Adjunct Associate Professor
 Design of Hydro generation plants,
 EHV Transmission systems,
 Power system Protection,
 Station Automation Systems

VISION

To provide world class education, research and consultancy services in the field of water resources development and management.

MISSION

To provide world class education, research and consultancy services in the field of water resources development and management. To provide world class education, research and consultancy services in the field of water resources development and management.

कर्म गौन

CORE VALUES

Integrity, Innovation, Quality, Service, Sustainability, Leadership, Teamwork, Accountability, Excellence, Innovation, Quality, Service, Sustainability, Leadership, Teamwork, Accountability, Excellence.

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE

(Formerly University of Roorkee)



INFORMATION BROCHURE 2017-2018

One-Year P.G. Diploma Programmes
and
Two-Year M.Tech. Degree Programmes
in

WATER RESOURCES DEVELOPMENT
(For Civil, Electrical, and Mechanical Engineers)

&
IRRIGATION WATER MANAGEMENT
(For Civil Engineers, Agricultural Engineers, and
Agricultural Scientists)



Department of

Water Resources Development and Management
(Formerly Water Resources Development Training Centre)
IIT Roorkee, Roorkee – 247 667
Uttarakhand, INDIA

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(<http://www.iitr.ernet.in/departments/WRT/pages/index.html>)

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IMPORTANT INFORMATION

The Department of Water Resources Development and Management (WRD&M), (formerly Water Resources Development Training Centre (WRDTC)) offers, One-year P.G. Diploma Training and Two-year M.Tech. Degree in Water Resources Development and Irrigation Water Management.

Candidates are admitted in three categories:

1. Government/Semi Government/PSU Sponsored Candidates from India.
- Candidates should apply through this information brochure
2. Sponsored candidates from foreign countries
- Candidates should apply through Indian Mission
3. Fresh undergraduates with GATE
- Candidates should apply through website of IIT Roorkee

Last date of application form submission : June 15, 2017
Date of start of academic session : July 14, 2017

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 June 15, 2017

The Academic Session will start in the second week of July 2017

The selected candidates shall be governed by rules and regulations of Indian Institute of Technology Roorkee (IITR). In case of any dispute in interpretation of these 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 through this Information Brochure. Remaining candidates can apply through the advertisement released by PG Admission office of IIT Roorkee in the month of March every year.

For further information please visit the website or contact:

Dr. S. K. Mishra
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FOREWORD

The rising demand of water to meet the requirements for agriculture, industry, hydropower, municipal and rural water use, and environmental flows in a sustainable manner has presented a challenge for the planners and water managers to strike a balance between demand and supply of water. In order to address such issues and develop trained manpower to undertake complex works of Water Resources Development and Management in Asian, African and Latin American Countries, the Department of Water Resources Development and Management (WRD&M) (formerly known as Water Resources Development Training Centre) was founded on Nov. 25, 1955 as a follow up of Bandung Conference held in April 1954 as envisioned by late Pt. Jawahar Lal Nehru, the first Prime Minister of India and late Dr. A.N. Khosla, an Indian Water Resources Engineer and the then Vice-Chancellor of University of Roorkee, presently known as Indian Institute of Technology Roorkee.



During the last 61 years the Department has grown significantly and provided training to 2681 in-service water professionals of 51 friendly countries. Many of its alumni are occupying top-level decision-making positions in their organizations (Water/Irrigation/Agriculture etc.) in their countries/states.

The Department of WRD&M is unique due to the expertise available in the fields of planning, investigation, design, construction, operation and maintenance of River Valley Multipurpose Projects and Irrigation and Drainage Systems (large/medium/small). The department provides high quality Post Graduate Education and specialized training in the fields of Water Resources Development and Irrigation Water Management.

It has been a constant endeavor to provide state-of-the-art education and training by keeping the curriculum abreast with the latest developments to meet the aspirations of the trainees and their sponsoring agencies. The Department currently offers the following academic programmes:

1. Water Resources Development (for Civil, Electrical and Mechanical Engineers)
 - Training (One year duration)
 - Post Graduate Diploma (Two-Semester Course)
 - Master of Technology (Four-Semester Course)
2. Irrigation Water Management (for Civil/Agricultural Engineers and Agricultural Scientists)
 - Training (One-year duration)
 - Post Graduate Diploma (Two-Semester Course)
 - Master of Technology (Four-Semester Course)

This information brochure describes in brief the facilities available, academic programmes including Research and Consultancy, admission eligibility & available fellowships, curriculum etc. Application form and estimated tuition fees etc. is also given in this information brochure.

It gives me great pleasure to invite all organizations (state, central or private enterprises) dedicated to Water Resources Development and Management to sponsor their officers to undergo this training/degree programme and sharpen their professional skills.


(Prof. Ajit Kumar Chaturvedi)
Director, IIT Roorkee

PREFACE

Water resources development and management infers planning for development of water resources and management for its optimum use. Water is an essential resource and demands for equitable allocation of fresh water to meet the rising demand, and therefore, proper management has been considered by planners as the prime objective in view of the increasing population and water scarcity. Adaptation policies should be rigorous and must meet the demand on regional basis as, in a huge country like India, proper water management processes involve pricing strategies to meet the goal.



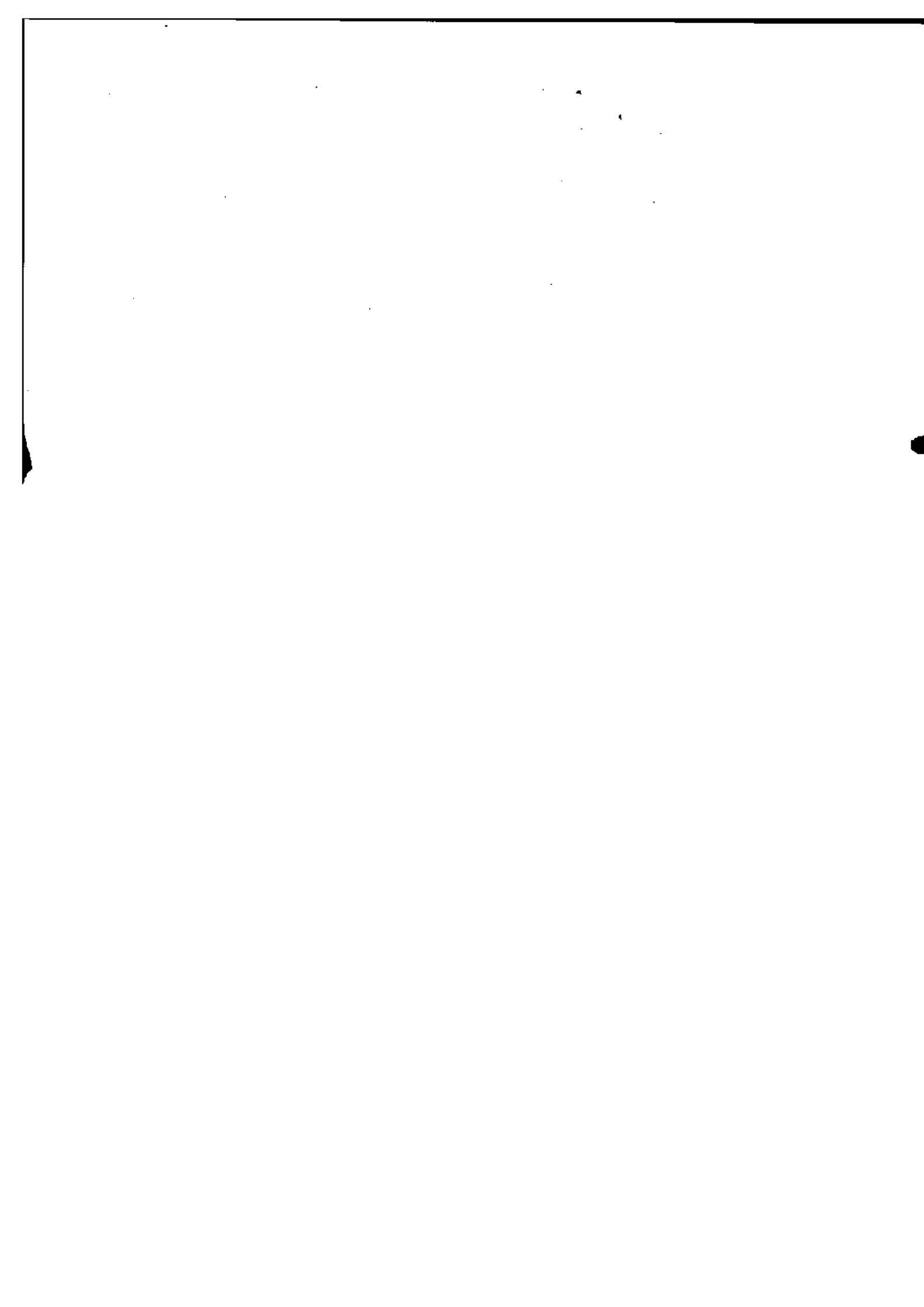
The Department of Water Resources Development and Management (formerly Water Resources Development Training Centre) of IIT Roorkee in the last more than sixty years has achieved a high level of performance in training the young minds and intellectuals with proper knowledge and goals. This Department has earned its own level of reputation and fame globally by imparting knowledge and education to many students involving scientists and professionals from national and international organizations from Asia, South America, and Africa. Significant contributions of the students in different fields are found all over the world who have performed with excellence to make a distinction of their own in the field of water resources.

Two Post-Graduate programmes are offered in this department, viz., Water Resources Development (WRD) (for Civil/Electrical/Mechanical Engineers) and Irrigation Water Management (IWM) (for Civil/Agricultural Engineers/Agricultural Scientists). The duration of the course work is 24 months which includes lectures, laboratory practical, educational tours and project reports with dissertation. These Master of Technology (M. Tech) programmes are unique to provide knowledge to the students in respective fields through credit based course works, and also help in developing specialization in their field of interest. The programmes are constantly updated to incorporate subjects of great contemporary value and technology in water science like use of Remote Sensing and GIS in water resources and climate change.

Faculty of the Department is outstanding in their respective fields of specialization and has long experience in planning, design, construction, operation, and maintenance of multipurpose water resources projects. Teaching in the Department has unique blend of both practical and theoretical concepts. The Department is very actively involved in research, consultancy, and extension activities. It is also known as a centre of excellence in Design of Water Resources Structures, Irrigation Planning and Management, Flood Control, Irrigation and Drainage, and Hydro Power Development.

This Information Brochure of the Department providing information regarding different academic programmes is applicable to sponsored candidates only. Indian graduates are admitted through GATE for filling 12 seats in WRD and 03 seats for IWM programmes and these candidates are required to apply separately in response to IIT Roorkee notifications for post-graduate admissions. Foreign candidates need to apply through Indian Mission. Sponsoring agencies are requested to encourage their officers to undergo training here by taking advantage of the facilities available in this department.


(Prof. S.K. MISHRA)
Head of the Department



1.0 INTRODUCTION

1.1 General

In most of the developing countries of Asia, Africa and the Far East, droughts and floods continue to hamper agricultural production and other productive activities and cause widespread misery for want of adequate control on rivers. A large part of their surface water resources remain untapped for irrigation, flood control and hydropower potential because of their economic backwardness. The growing population and the urgency for food and economic betterment call for the need of efficient use and management of water resources to step up their agricultural and industrial production. Trained manpower to prepare plans to undertake Water Resources Development projects that yield into agricultural, industrial and economic development is needed by most of the developing countries. Mighty rivers when tamed by constructing dams, irrigation canals and hydropower stations can transform industrial and agricultural growth of a country. Investigation, planning, design and construction of such major river valley developments projects need a high degree of engineering skill and knowledge about design and construction practices. The need of trained manpower in Water Resources Development and Management for developing countries to undertake such a gigantic task was keenly felt in 1954 at Bandung Summit. Consequently this department was founded on Nov. 25, 1955 at the erstwhile University of Roorkee now Indian Institute of Technology Roorkee.

1.2 The Institute

Indian Institute of Technology Roorkee has its roots in the Roorkee College established in 1847 as 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 has now 21 academic departments covering engineering, applied sciences, humanities & social sciences & management programme, 1 academic centre, 3 centres of excellence & 5 academic service centres.

Prior to becoming an IIT, the University of Roorkee was accredited by the National Assessment and Accreditation Council (NAAC), an autonomous institution of the University Grant Commission (UGC), with FIVE STARS (*****) for a period of five years in the year 2010. This is the highest grade that NAAC awards on five-point scale.

1.3 The Department

The proposal for establishing a training centre in Water Resources Development originated with the United Nations Economic Commission of Asia and the Far East (now known as ESCAP) some time in 1951-52 and the Centre was established at the erstwhile University of Roorkee on November 25, 1955. The essential equipment was provided under the then U.S. Technical Cooperation Mission and U.N. Technical Assistance Board. The government of India provided funds for the building and other facilities and agreed to bear the entire recurring expenditure. The USAID, UNDP and ICABF provided specialists for short-term lecture arrangement.

The choice for opening the Centre fell on India, which had the unique distinction of having the biggest network of irrigation works, the largest area under irrigation and the

greatest variety of irrigation structures. After independence, India also had embarked on an ambitious programme of construction of river valley projects. Erstwhile University of Roorkee being successor to the Thomason College of Civil Engineering the oldest and best-known technical institution in the East and having the basic infrastructure for imparting such training was obvious for establishing the Centre. Dr. A.N. Khosla, a legendary figure in the field of Water Resources Engineering and then Vice-Chancellor of the erstwhile University of Roorkee was the founder Director of the Centre. Subsequent upon the conversion of University of Roorkee in Indian Institute of Technology Roorkee, the Water Resources Development Training Centre (WRDTC) was renamed as the Department of Water Resources Development and Management (WRD&M). The Department offers M. Tech. and Post-Graduate training programmes for specialization in the fields of Water Resources Development (for civil, electrical, and mechanical engineers) and Irrigation Water Management (for civil engineers, agricultural engineers, and agricultural scientists) separately.

1.4 The Campus

The campus of the Indian Institute of Technology Roorkee is located at an elevation of 268m (880 ft) above mean sea level (longitude 77°54'E and latitude of 29°52'N). The place is situated only 30-60km (19-35 miles) south of the foothills of the Himalayas (Haridwar and Rishikesh) and is within easy reach of New Delhi, the capital of India, at a distance of about 180 km by road. It is also connected by rail to Delhi, Bombay and almost all State's capitals.

The atmospheric temperature of Roorkee varies from 2.5°C (36.5°F) to 34°C (94°F) in winter and from 13°C (55°F) to 45°C (113°F) in summer. The annual rainfall averages 1041mm (41 inches), the bulk of which occurs during mid June to mid of September. The only hot months are May and June but these are not particularly uncomfortable. The rainy and winter months are generally pleasant. Clothes of cotton, silk or terylene and mosquito nets are required during summer and rainy seasons while woolen suits and blankets are essential during winter.

1.5 Medium of Instruction

The medium of instruction at the Department is English. Engineer trainees are expected to have sufficient working knowledge of English language.

1.6 Objective and Achievements

The Department was established with the objective to train serving engineers from Asia, Africa and other developing countries in various aspects of Water Resources Development and to bring together engineering talent from these countries for a first-hand understanding and appreciation of each others problems and to help evolve, by pooling of knowledge, new techniques in water resources development and management suited to conditions of Afro-Asian region. In addition, the programme of education in the department helps foster a feeling of brotherhood amongst the engineers of various countries.

Since its creation in 1955, the department has trained 2684 serving engineers from 51 countries as detailed below:

Name of Country	No. of Trainees	Name of Country	No. of Trainees	Name of Country	No. of Trainees	Name of Country	No. of Trainees
Afghanistan	33	Indonesia	501	Mongolia	1	Sri Lanka	36
Bangladesh	17	Iran	1	Mexico	1	Sudan	36
Brazil	1	Iraq	14	Myanmar	15	South Sudan	2
Bhutan	2	Japan	1	Nicaragua	1	Syria	10
China	3	Jordan	2	Nigeria	1	Tanzania	17
Costarica	1	Kenya	6	Nepal	143	Thailand	20
Cuba	1	Kazakhstan	2	Panama	1	UAE	1
Egypt	7	Lao PDR	9	Pakistan	1	Uganda	2
Eritrea	1	Liberia	1	Philippines	42	Uzbekistan	12
Ethiopia	21	Malawi	3	Senegal	1	Vietnam	52
Ghana	13	Malaysia	7	Sierra Leone	4	Yemen	7
Guyana	1	Maldives	1	South Korea	3	Zambia	3
India	1613	Mauritius	1	Singapore	1	Grand Total	2681

2.0 FACILITIES

2.1 General

The Department and the Institute have all the required facilities to provide training in the fields of Water Resource Development and Irrigation Water Management of the international standard which are briefly described below.

2.2 Library

The Department has a library of its own which is equipped with the latest literature on the topics relating to Water Resources Engineering and Irrigation Water Management. The Department subscribes regularly several to important journals and other periodicals in these fields. The proceedings of many important conferences and symposia in the field of Water Resources Engineering and Irrigation Water Management are also available. Considerable effort and resources are devoted to keep the library up to date. About 12000 books and 2400 periodicals are available in the Departmental library.

Apart from the departmental library, the Institute has modern well-equipped library housed in a separate block. It has literature on all engineering subjects.

2.3 Laboratories

The Department has its own laboratories of Soil Mechanics and Irrigation Water Management, Dam Stress, Rock Mechanics Groundwater and River Engineering and Electrical Testing 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 and Earth Sciences etc.

2.4 Model Room

The Department has a well-equipped model room with models and charts showing different aspects of several important water resources projects including layout of works, structural details, construction facilities, etc. Working models of tunneling operations and some major construction equipments also form part of the model room.

2.5 Class Rooms/Lectures Theater and Seminar Rooms

The Department has spacious and well-ventilated classrooms and lecture theater for regular classes. These rooms are well equipped with overhead projector, multimedia projection etc. The seminar room is equipped with overhead projector & multimedia projection system.

2.6 Computer Laboratory

The Department has a computer laboratory with adequate facilities. The computer laboratory is being used for imparting education and development and use of various software for analysis of water resources problems. In addition to the departmental computer laboratory the computer centre of IIT Roorkee is equipped

with high end technical equipments like Param 10000 and IBM/6000, Alpha Server, SGI Server and many other Servers, along with large number of PCs and six laboratories which include Linux and Unix labs. Internet access is available from 8 A.M. to 11 P.M. on all the 7 days in week.

2.7 Lodging and Boarding

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

2.8 Other Facilities

The facility of PG students club, Multi Activity Centre, sports complex, swimming pool, and cinema of the IIT Roorkee can be availed by the trainee officers. Facilities of a well-equipped Hospital, Dairy, Bakery and a Cooperative Consumers' Store are available in the campus. A post office as well as the branches of State Bank of India & Punjab National Bank is also located within the campus. Computerized centre for reservation of railway journey is available in the campus.

2.9 Demonstration Farm

A new demonstration farm for research work related to soil-water-plant relationship studies, various methods of irrigation etc. Has been developed.

3.0 ACADEMIC PROGRAMMES, RESEARCH AND CONSULTANCY

3.1 General

Academic programs, research and consultancy services offered at this Department are governed by rules and regulations of the Institute which are reviewed and modified from time to time to keep pace with changes in the field of Water Resources Development. Brief information about present status is given below.

3.2 Academic Programmes

The Department offers broad based programmes of education and training in all aspects of Water Resources Development and Irrigation Water Management to in-service engineers and professionals having at least two years work experience. The following programmes are offered by the Department:

- P.G. Training/P.G. Diploma/M.Tech. in Water Resources Development (For Civil, Electrical, and Mechanical Engineers)
- P.G. Training/P.G. Diploma/M.Tech. in Irrigation Water Management (For Civil Engineers, Agricultural Engineers, and Agricultural Scientists)
- Ph.D. Programmes

The students may opt for either the two-semester training/P.G. Diploma or four semesters M.Tech. Degree Programme or Ph.D Programme depending on their eligibility as per Institute rules. The details for admission for Ph.D. Programmes are announced by IIT Roorkee separately. The candidates are required to visit the Institute website or look for the Institute advertisement. The minimum qualification for admission to Ph.D. program in the department is as follows:

1. **Water Resources Development**
B.E./B.Tech./M.E./M.Tech. or equivalent degree in Civil, Electrical, Mechanical & Agricultural Engineering.
2. **Irrigation Water Management**
Master's degree in Agricultural Sciences/Social Sciences/Chemical Engineering/Biological Sciences/ Environmental Sciences/Engineering/Natural Sciences with at least one paper of Mathematics at the graduate level or equivalent with a qualified NET/CSIR/UGC/NET(LS) or qualified GATE and minimum CGPA of 6.50 on a 10- point scale or equivalent as determined by the institute where letter grades are awarded or 60% where marks are awarded.

The students admitted to M.Tech. Programmes have to carry out extensive research work in third and fourth semesters. A choice from several selective subjects is available for the course work. These subjects usually provide advanced level of knowledge, which can be applied to field problems. The subject of dissertation

covers useful practical or theoretical problems and each student carries out his/her dissertation work under the guidance of one or more faculty members. Some of the unique features of academic programmes of this department are as follows:

3.2.1 Visits to projects

Visits to various water resources projects in the Country form an important aspect of the academic programme. The visits are undertaken to existing projects or under construction or recently completed and to command area development works. The students study the choice of the type of dam and its design, river diversion arrangements, construction organization, degree of mechanization, etc. and the problems of water use and command area development. Lectures are delivered at the project sites by field engineers closely connected with project problems. Discussions are oriented to bring out various problems faced in field along with their at-site solutions.

Each student is required to submit a report showing an objective appraisal of the projects visited. These reports are examined and assessed by the faculty accompanying the tours. A viva-voce examination of the students is also conducted before final assessment.

3.2.2 Diagnostic analysis

The students admitted to Irrigation Water Management programme are required to carry out diagnostic analysis of a canal system. The study involves site visit for evaluation of main canal system, on-farm system, cropping pattern and socio-economic aspects. This important part of training involves interdisciplinary study and exposes students to the field problems of irrigated agriculture. The students collect field data, analyze it and prepare a report. These reports are examined and assessed by the faculty guiding the analysis. A viva-voce examination of the students is also conducted before final assessment.

3.3 Short Term Training Programmes

The Department has also been offering special short-term training courses in Water Resources Development and Irrigation Water Management for the benefit of in-service engineers from time to time. The Department has organized several special short-term courses at the request of foreign and Indian Governments for training engineers, agriculturists and administrators in specialized fields. These include courses on (i) Ground Water Management for the officials of Govt. of Indonesia, (ii) Design and Operation of Barrage for engineers from Philippines, (iii) Water Supply Technology for engineers from Zimbabwe (iv) Construction Management Through Systems Techniques for Engineers from Bangladesh, (v) Irrigation Agronomy & Extension for engineers & Agronomists from Ethiopia, and (vi) Various specialized themes related to water resources development and management for engineers of Afghanistan etc. Some short courses were also organized jointly with Asian Institute of Technology (AIT), Bangkok. The Department has also organized short-term courses for training of senior level executives and administrators in water resources development and administration under the sponsorship of the Training

Division of the Department of Personnel and Administrative Reforms, Government of India. In brief, the Department has all facilities to conduct such short-term training programmes in the fields of Water Resources Development and Irrigation Water Management including environmental flow, sustainable development, rural urban water supply and so on.

3.4 Research Projects and Consultancy Activities

In addition to research activities through M.Tech and Ph.D. dissertations, the Department is actively engaged in sponsored research projects. The Department also renders useful technical services to various organizations and helps in solving complex field problems through consultancy and research projects sponsored by national and international organizations of repute like Ministry of Water Resources (MoWR), Indian Space Research Organization (ISRO), Department of Science and Technology (DST), Government of India and Hydro Coop Paris. There has been a considerable expansion in research and consultancy activities in the Department in recent years. In the areas of Water Resources Planning, Design, Development and Management (Hydropower, Water Supply, Flood, Control, Irrigation), Surface and Ground Water Hydrology, Environmental Impact Assessment, Water Quality Modeling, Hydraulic and Hydrologic Design Modeling, River Engineering, System Analysis, Interbasin Transfer, Basin Planning and Development, Irrigation Water Management, Agricultural Crop Planning, Natural Resources Management using Remote Sensing and GIS, variable Speed Pumped Storage Plants, Hydro-Electric Systems.

3.5 Placement Status of GATE Students

In the past, majority of the students admitted through GATE has been suitably placed in academic/research/ industry after completion of their M.Tech Programmes.

4.0 ADMISSION AND FELLOWSHIP

4.1 General

Admission and Fellowship of the sponsored candidates is governed by rules and regulations of the Institute and Government of India, which are reviewed and modified from time to time. Brief information about eligibility requirements for admission to various courses and fellowship are given below:

4.2 Categories of P.G. Officer Trainees and Students

The P.G. Diploma/Training and M.Tech. Programme in Water Resources Development (WRD) (for Civil / Electrical / Mechanical engineers) will have a total intake of 50 students with a maximum of 10 each from Mechanical Engineering and Electrical Engineering backgrounds, while remaining 30 seats are earmarked for those having Civil Engineering background. P.G./M.Tech. Programme in Irrigation Water Management (IWM) (for Civil / Agricultural engineers / Agricultural Scientists) will have a total intake of 20 students. In addition, twelve (12) seats in WRD and three seats (3) in IWM are filled through GATE qualified fresh Indian graduates.

For the purpose of admission and award of scholarships, the officer trainees are grouped into five categories as follows:

Category	Group of Officers/Students
I	Officer trainees sponsored by Indian or foreign governments whose total expenses (including pay and allowances, tour expenses, etc.) are borne by the sponsoring government or met under some aid programmes.
II	Officer trainees sponsored by industry and public/private enterprises in India whose expenses are fully met by their sponsors as in category I.
III	Government nominees from India on study leave on full pay or on half pay but not entitled to any other payments from their employers or as Part-Time students.
IV	Government nominees on leave of a kind other than study leave.
V	Students admitted through GATE.

4.2.1 Eligibility for Admission

Eligibility criteria for admission to various programmes are given below:

Programme	Eligibility Qualification
P.G. Dip. / Training / M.Tech Water Resources Development	Bachelor Degree in Civil/Electrical/Mechanical/ Electronics & Tele-Communication Engineering or its equivalent.
P.G. Dip. / Training / M.Tech Irrigation Water Management	Bachelor Degree in Civil Engg. or equivalent /Agricultural Engineering or its equivalent or M.Sc. Agriculture in Agronomy, Soil Science, Agro meteorology with mathematics as one of the paper at the level of B.Sc./B.Sc. Agriculture.

Requisite Experience
(For sponsored Candidates): As per enclosed Appendix - I

PG Dip./Training/M. Tech. As per enclosed Appendix - III

Part time candidate

PhD

The details of admission to PhD programmes are announced by IIT Roorkee separately. The candidates are required to visit the Institute website or look for the Institute advertisement.

Notes:

Minimum Marks

For General/OBC category candidates, minimum 60 % marks or CGPA 6.00 on 10 - point scale or equivalent grade is required in the qualifying examination.

For SC/ST/PD (Person with Disability) candidates, minimum 55% marks or CGPA 5.5 on 10 - point scale or equivalent grade is required in the qualifying examination.

Training

The department also offers 12 months training programme for sponsored candidates having less than 60% marks

Equivalent qualification of Bachelor degree in engineering shall be considered if found acceptable by the equivalence committee of the Institute.

Educational Institutions of India should be recognized by All India Council for Technical Education (AICTE).

QIP

A few candidates can be admitted under Quality Improvement Programme (QIP) for which aspirants may contact the Coordinator (QIP), Indian Institute of Technology Roorkee, Roorkee -247667.

4.3 Procedure for Admission and Grant of Scholarship

Applications for admission must reach the Department by 15 June 2017 positively so that the selection of candidates is notified by last week of June 2017.

The estimated expenses for the two semesters PG Diploma and four semesters M.Tech. Degree programmes are given in Appendix -VI.

4.3.1 Indian Candidates

Applications should be submitted in the prescribed form (Appendix-II) completed in all respect and duly endorsed by the employer/government or organization. No scholarship is available for sponsored Indian candidates whether full-time & part-time. However, there should be a certificate of financial guarantee from the sponsoring government organization for meeting all expenses along with a provision for allowances during their academic degree programmes.

4.3.2 Foreign Candidates

The application of candidates sponsored by foreign governments for admission should be submitted to Indian mission in their country. These students should send the completed checklist given in the Appendix-V to Prof. & Head, Dept. of WRD&M.

The procedure for obtaining various scholarship/fellowship is described below:

(a) Government of India Scholarship/ Fellowship

For ITEC and for SCAAP Awards, applications should be submitted in the prescribed

form (Appendix-II) and sent through Embassies/Missions of India to *The Ministry of External Affairs, Technical Cooperation Division, B-Wing, Jawaharlal Nehru Bhawan, 23-D Janpath, New Delhi - 110011 India*

For TCS (Colombo Plan), applications in Form A2 and A3 (obtainable from Embassies/Missions of India in the countries of the candidates) should also be sent through Embassies/Missions of India to *The Ministry of External Affairs, Technical Cooperation Division, B-Wing, Jawaharlal Nehru Bhawan, 23-D Janpath, New Delhi - 110011 India*, along with application in the form in Appendix-II. The duration of fellowship shall be one year/two year as per policy of Government of India on date.

(b) United Nations/ESCAP Fellowship

Applications of candidates for admission and grant of United Nations/ESCAP (Economic and Social Commission for Asia and the Pacific) fellowships should be submitted in the prescribed form (UN/ESCAP) and forwarded in accordance with the procedure prescribed by the government of the applicant's country to the United Nations Headquarters, New York, or ESCAP, Bangkok as the case may be through the Resident Representative of his/her country under notification to *Prof. & Head, Department of Water Resources Development & Management, Indian Institute of Technology Roorkee, Roorkee 247667, India* and to the Resident Representative, United Nations Development Programme, 55, Lodi Estate, New Delhi 110003, India.

(c) Commonwealth Scholarship

Applications of candidates from Commonwealth countries for admission and grant of scholarship under the Commonwealth Fund of Technical Cooperation should be submitted in the prescribed form (Appendix-II) and forwarded through the Embassies/Missions of India to the Director, Fellowships and Training Programme, Commonwealth Fund for Technical cooperation, Commonwealth Secretariat, Marlborough House, Pall Mall, London SW 1Y 5HX, with a copy to Prof. & Head, Water Resources Development and Management, Indian Institute of Technology Roorkee, Roorkee 247667 India.

(d) Government Sponsored

Applications of candidates sponsored by foreign governments at their own cost may be submitted in the prescribed form (Appendix-II) and forwarded through the Embassies/Missions of India to the *Prof. & Head, Department of Water Resources Development & Management, Indian Institute of Technology Roorkee 247 667, India* with a copy to *The Ministry of External Affairs, Economic Division, Government of India, Akbar Bhawan, Chanakya Park, New Delhi 110021, India*. However, in this case the charges to be paid by the candidate shall be intimated separately on request.

4.4 HIV Test

The Govt. of India has made test for HIV compulsory for all Foreign Students arriving India. It is therefore desired that every Foreign Trainee (Scholarship holder or Self Financing) coming to India should get themselves checked for HIV before leaving his home country, irrespective of the fact that he/she will be subjected to HIV test after joining the program at this department.

4.5 VISA Regulations

Foreign students intending to come to India for studies whether on self-financing basis or on Govt. of India scholarships, are required to get STUDENT'S VISA from Indian missions abroad. For students on Govt. of India scholarships, respective Indian missions are instructed by ICCR to grant regular students Visa once their admissions in Indian Universities are confirmed. Students not having firm letters of admission from universities etc., will be issued Provisional Students Visa by the Indian missions abroad on the basis of provisional admission certificate issued by university/recognized college or educational institution in India. Such Provisional Students' Visa will be valid for a period of 3 months and no extension of Provisional Students' Visa will be allowed. Change of Purpose of visit of foreign trainees to India is not allowed once they reach India. To avoid this situation, all foreign students on self-financing basis are requested to obtain regular students' Visa from Indian Missions abroad by producing confirmed letter of acceptance/admission certificate from the University/Institution.

PROGRAMME ELECTIVES COURSE (WRD)

S.No	Code	Course Title	Prerequisites	ECTS	L	T	P	Th	Pr	Ex	Pr	Pr	Pr	Pr	Pr
1.	WR-511	Control of Engineering	PEC	4	3	1	-	3	-	25	-	25	50	-	-
2.	WR-512	Hydro-power and Appurtenant Works	PEC	4	3	1	-	3	-	25	-	25	50	-	-
3.	WR-513	Work and Rest/Shift Work	PEC	4	3	1	-	3	-	25	-	25	50	-	-
4.	WR-514	Manometry and Concrete Tests	PEC	4	3	1	-	3	-	25	-	25	50	-	-
5.	WR-515	Timber Structures	PEC	4	3	1	-	3	-	25	-	25	50	-	-
6.	WR-516	Design and Construction of Water Supply	PEC	4	3	1	-	3	-	25	-	25	50	-	-
7.	WR-517	Water Treatment	PEC	4	3	1	-	3	-	25	-	25	50	-	-
8.	WR-518	Finite Element Methods	PEC	4	3	1	-	3	-	25	-	25	50	-	-
9.	WR-519	Water Treatment System Reliability	PEC	4	3	1	-	3	-	25	-	25	50	-	-
10.	WR-520	Environmental Impact Assessment of Water Resource Projects	PEC	4	3	1	-	3	-	25	-	25	50	-	-
11.	WR-521	Groundwater Hydrology	PEC	4	3	1	-	3	-	25	-	25	50	-	-
12.	WR-522	Climate Change and Water Resources	PEC	4	3	1	-	3	-	25	-	25	50	-	-
13.	WR-534	Sustainable and Environmentally Sound Design	PEC	4	3	1	-	3	-	25	-	25	50	-	-
14.	WR-535	Foundation Measurements and Testing of Hydro-Construction Techniques	PEC	4	3	1	-	3	-	25	-	25	50	-	-
15.	WR-536	Maintenance Management in Power Plants	PEC	4	3	1	-	3	-	25	-	25	50	-	-
16.	WR-537	Power System Management	PEC	4	3	1	-	3	-	25	-	25	50	-	-
17.	WR-538	Electrical Design of Hydro Power Station	PEC	4	3	1	-	3	-	25	-	25	50	-	-
18.	WR-539	Power System Operation and Control	PEC	4	3	1	-	3	-	25	-	25	50	-	-
19.	WR-540	Control and Instrumentation of Hydro Power Plant	PEC	4	3	1	-	3	-	25	-	25	50	-	-
20.	WR-541	Power System Analysis	PEC	4	3	1	-	3	-	25	-	25	50	-	-
21.	WR-542	Power System Reliability	PEC	4	3	1	-	3	-	25	-	25	50	-	-
22.	WR-543	Control Systems	PEC	4	3	1	-	3	-	25	-	25	50	-	-
23.	WR-544	Principles and Design of Small Hydro Power Stations	PEC	4	3	1	-	3	-	25	-	25	50	-	-
24.	WR-545	Power Electronics Control of Hydro-Electric Systems	PEC	4	3	1	-	3	-	25	-	25	50	-	-
25.	WR-546	Modeling and Simulation of Hydro-Electric Energy Systems	PEC	4	3	1	-	3	-	25	-	25	50	-	-
26.	WR-547	Synthesis and Application of Power Electronics	PEC	4	3	1	-	3	-	25	-	25	50	-	-
27.	WR-548	Power Electronics Laboratory	PEC	4	1	-	6	-	3	-	50	-	-	-	-
28.	WR-549	Control and Instrumentation Laboratory	PEC	4	1	-	6	-	3	-	50	-	-	-	-
29.	WR-550	Design of Construction Job Facilities	PEC	4	3	1	-	3	-	25	-	25	50	-	-
30.	WR-551	Construction Plant Efficiency	PEC	4	3	1	-	3	-	25	-	25	50	-	-
31.	WR-552	Cost Estimation and Scheduling	PEC	4	3	1	-	3	-	25	-	25	50	-	-
32.	WR-553	Construction Technology	PEC	4	3	1	-	3	-	25	-	25	50	-	-
33.	WR-554	Design of Irrigation Structures and Drainage Works	PEC	4	3	1	-	3	-	25	-	25	50	-	-
34.	WR-572	Soil and Agronomy	PEC	4	3	1	-	3	-	25	-	25	50	-	-
35.	WR-580	Renewable Energy Systems Technology	PEC	4	3	1	-	3	-	25	-	25	50	-	-
36.	WR-581	Water Quality Modelling and Monitoring	PEC	4	3	1	-	3	-	25	-	25	50	-	-
37.	WR-583	Remote Sensing and GIS Applications in Agriculture	PEC	4	3	1	-	3	-	25	-	25	50	-	-
38.	WR-584	Groundwater Development and Management	PEC	4	3	1	-	3	-	25	-	25	50	-	-
39.	WR-577	Water Resource Development and Management	PEC	4	3	1	-	3	-	25	-	25	50	-	-

Table 2 - Academic Curriculum for Master of Technology/P.G. Diploma in IRRIGATION WATER MANAGEMENT (IWM)

S.No	SUBJECT CODE	COURSE TITLE	SUBJECT AREA	CREDITS	Contact Hours per Week			Exam. Duration (Hrs.)	Relative Weightage (%)								
					L	T	P		CWS	PRS	MTE	ETE	PRE				
I YEAR													I SEMESTER (AUTUMN)				
1.	WR-501	System Design Techniques	PEC	4	3	1	0	3	-	25	-	25	50	-	-		
2.	WR-511	Design of Irrigation Structures and Drainage Works	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
1.	WR-572	Soil and Agronomy	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
4.	WR-573	Principles and Practices of Irrigation	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
5.		Program Elective Course	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
Sub Total				20													
II SEMESTER (SPRING)													II SEMESTER (SPRING)				
1.	WR-574	Diagnostic Analysis	PEC	2	-	-	4	-	-	-	-	90	-	-	50		
2.		Program Elective Course	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
3.		Program Elective Course	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
4.		Program Elective Course	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
5.		Program Elective Course	PEC	4	3	1	-	3	-	25	-	25	50	-	-		
6.	WR-700	Seminar	SUM	2	-	-	-	-	-	-	-	100	-	-	-		
Sub Total				20													
III YEAR													III SEMESTER (AUTUMN)				
1.	WR-201A	Examination Stage I	ENS	18	-	-	-	-	-	-	-	-	-	-	40		
Sub Total				18													
IV SEMESTER (SPRING)													IV SEMESTER (SPRING)				
1.	WR-201B	Examination Stage II (contd. From I st Semester)	ENS	18	-	-	-	-	-	-	-	-	-	-	40		
Sub Total				18													
Total				78													

Note: P.G. Diploma course is 100% shall be of ONE YEAR duration comprising of semesters I and II only, with a minimum number of 60

4. In the event of any change to be recorded in the next semester

5.0 CURRICULUM AND PERFORMANCE EVALUATION

5.1 General

Curriculum and Performance Evaluation is governed by rules and regulations of the Institute, which are reviewed and modified from time to time. Brief information about present status of Curriculum and Performance Evaluation in various courses is given below:

5.2 Curriculum

Post-Graduate education demands the right kind of ambience, a good infrastructure, an acclaimed and dedicated faculty and considerable flexibility in the course structure. IIT Roorkee is the institute, which provides these ingredients in abundance. Every course has been assigned certain number of credits depending on the workload it involves. The performance of the candidate is continuously evaluated to motivate students to improve their performance throughout the duration of programme and a letter grade is awarded on the completion of the course. The course structure has enough flexibility and allows a student to progress at an optimum pace, commensurate with his intellectual quotient and convenience.

5.2.1 Teaching scheme

The course structures of the two academic Programmes provide sufficient flexibility for specialization in (i) Water Resources Development (for civil / electrical / mechanical engineers) and (ii) Irrigation Water Management (for civil / agricultural engineers / agricultural scientists). The academic curriculum for Master of Technology/PG Diploma is given in Tables 1 & 2.

5.2.2 Credits (Crs) and weekly contact Hours

Each course (subject) has a number of 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 two hours of tutorial or practical per week and distribution is expressed as Crs (L-T-P).

Table 1 - Academic Curriculum for Master of Technology / P.G. Diploma in WATER RESOURCES DEVELOPMENT (WRD)

S. NO	SUBJECT CODE	COURSE TITLE	SUBJECT AREA	CREDITS	Contact Hours/week			Exam. Duration (Hrs.)	Relative Weights (%)													
					L	T	P		Theory	Practical	Lab	MCQ	ITC	ORL								
I SEMESTER (AUTUMN)																						
1.	WR-01	Systems Design & Technology	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
2.		Hydrology Course 1	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
3.		Programme Course 2	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
4.		Programme Course 3	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
5.		Programme Elective Course	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
Sub Total				20	45 per elective course																	
II SEMESTER (SPRING)																						
1.	WR-02	Introduction of Water Resources Engineering	PEC	2	-	-	4	-	-	-	-	50	-	-	50	-	-	-	-			
2.		Programme Elective Course	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
3.		Programme Elective Course	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
4.		Programme Elective Course	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
5.		Programme Elective Course	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-	-			
6.	WR-700	Seminar	SEM	2	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-			
Sub Total				20	45 per elective course																	
III SEMESTER (AUTUMN)																						
1.	WR-701A	Electives (Soc)	OTH	12	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-			
Sub Total				12																		
IV SEMESTER (SPRING)																						
1.	WR-701B	Electives (Technical)	ETS	18	-	-	-	-	-	-	-	-	-	-	90	-	-	-	-			
Sub Total				18																		
Total				70																		

Note: PG Diploma course in WRD shall be of 60% of OBE 5 FAR decision comprising of semester I and II only, with a minimum credit of 40.

PROGRAMME CORE SUBJECTS

For Civil Background

1.	WR-501	Design of Water Resource Structures	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-
2.	WR-502	Water Resources Planning and Management	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-
3.	WR-503	Applied Hydrology	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-

For Electrical Background

1.	WR-511	Hydro Generating Equipment	EEA	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-
2.	WR-512	Hydroelectric System Planning	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-
3.	WR-513	Power System Protection Application	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-

For Mechanical Background

1.	WR-522	Hydro-turbine System Planning	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-
2.	WR-523	Design of Turbo-mechanical Equipment	PEC	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-
3.	WR-524	Construction Planning and Management	ECG	4	3	1	0	3	-	25	-	25	50	-	-	-	-	-

PROGRAMME ELECTIVES

APPENDIX-1

S. No	SUBJECT CODE	Teaching Scheme COURSE TITLE	SUBJECT AREA	Contact Hours per Week			Exam. Duration (Hrs.)	Relative Weightage (%)							
				CREDITS	L	T		P	Theory	Practical	ORIS	PES	MTL	ETE	PRE
1.	WR-503	Water Resource Planning and Management	PEC	4	3	1	3	-	25	-	25	50	-	-	-
2.	WR-504	Applied Hydrology	PEC	4	3	1	3	-	25	-	25	50	-	-	-
3.	WR-513	Earth and Rockfill Dams	PEC	4	3	1	3	-	25	-	25	50	-	-	-
4.	WR-516	Rural and Urban Water Supply	PEC	4	3	1	3	-	25	-	25	50	-	-	-
5.	WR-520	Environmental Impact Assessment of Water Resource Projects	PEC	4	3	1	3	-	25	-	25	50	-	-	-
6.	WR-522	Climate Change and Water Resources	PEC	4	3	1	3	-	25	-	25	50	-	-	-
7.	WR-575	On Farm Development	PEC	4	3	1	3	-	25	-	25	50	-	-	-
8.	WR-576	Operation Maintenance and Management of Irrigation Systems	PEC	4	3	1	3	-	25	-	25	50	-	-	-
9.	WR-577	Water and Land Laws	PEC	4	3	1	3	-	25	-	25	50	-	-	-
10.	WR-538	Rural Sociology and Irrigation Economics	PBC	4	3	1	3	-	25	-	25	50	-	-	-
11.	WR-579	Evaluation of Irrigation Project	PEC	4	3	1	3	-	25	-	25	50	-	-	-
12.	WR-580	Renewable Energy Systems Technology	PBC	4	3	1	3	-	25	-	25	50	-	-	-
13.	WR-581	Water Quality Monitoring and Modeling	PEC	4	3	1	3	-	25	-	25	50	-	-	-
14.	WR-582	Theory of Storage	PEC	4	3	1	3	-	25	-	25	50	-	-	-
15.	WR-583	Remote Sensing and GIS Applications in Agriculture	PEC	4	3	1	3	-	25	-	25	50	-	-	-
16.	WR-584	Cropping System Modeling	PEC	4	3	1	3	-	25	-	25	50	-	-	-
17.	WR-585	Environmental Impact of Irrigated Agriculture	TRE	4	3	1	3	-	25	-	25	50	-	-	-
18.	WR-586	Groundwater Development and Management	PEC	4	3	1	3	-	25	-	25	50	-	-	-
19.	WR-587	Watered Development and Management	PEC	4	3	1	3	-	25	-	25	50	-	-	-

Experience (for sponsored candidates)

- (A) Full time sponsored candidates must have a minimum of two years of full-time work experience till the last date of submission of application form in responsible capacity in a Registered Firm/Company/Industry/Educational and Research Institution/Govt./Quasi Govt./Autonomous Organization 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 turnover during the past 2 years exceeds Rs. 5.0 crores. For a candidate employed in an educational Institution, it should be recognized by AICTE.
- (B) Candidates having AMIE/AMIS/AMIChe/AMITM/Grad IETE, who possess B.Sc. or Diploma in engineering and have at least three years research, teaching or other professional experience at the last date of submission of application acquired after passing the qualifying examination in relevant field, are also eligible to apply for admission to M.Tech. Courses.

APPENDIX - I

WATER RESOURCES DEVELOPMENT AND MANAGEMENT
 Indian Institute of Technology Roorkee, Roorkee - 247667, India
 (Application Form for Sponsored Candidates only)

Paste the
 Attested
 Photograph

APPLICATION FORM (2017-2018)

(Please select one Academic Programme out of A or B and tick in appropriate box)

A) Water Resources Development <input type="checkbox"/>	B) Irrigation Water Management <input type="checkbox"/>
Please check eligibility criteria in the Programme in which admission is sought	
<input type="checkbox"/> Relating Certificate <input type="checkbox"/> P.G. Diploma <input type="checkbox"/> M.Tech Degree	

Name (Block letters)
 (Mr/Ms)
 (Surname) (Middle name) (first name)

Present Address:

Tel. & Fax (with code):

Email:

Permanent Address:

Tel. & Fax (with code):

Email:

Place/Country of birth Date of birth Citizenship

Marital Status: Married/Unmarried.

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

A) Academic qualifications other than Engineering (beginning from High School):

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

B) Professional/Engineering Qualification:

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

C) 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 to him/her.
2. Attach attested copies of the certificates.
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.

D. Recommendations of Sponsoring/ Nominating Authority

The undersigned is pleased to sponsor Mr./Ms. who is working in this organisation for the last years and is presently holding the rank/position of for pursuing the P.G. Diploma Programme / M.Tech. Degree Programme in at IIT Roorkee in the WRD&M.

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 completion of the course.

Place: Signature of Head of the Institution/ Organization with seal

Date: Name:

Designation

NOTE: Medical Certificate in the enclosed Performa to be submitted with this application form.

MEDICAL CERTIFICATE PROFORMA

A. Candidate's Declaration

- 1. Name
- 2. Whether you have been treated for
 - (a) Hypertension (High Blood Pressure) Yes/No
 - (b) Diabetes Yes/No
 - (c) Mental illness Yes/No
- 3. Mark of Identification
(Signature of Applicant)
Dated.....

B. Doctor's Certificate

I certify that I have carefully examined Mr/Ms and find that he/she is healthy and he/she has no disease constitutional weakness or bodily deformity or medical infirmity rendering him/her unfit now or in future, for active outdoor service and strenuous studies except.....

I do not consider/do consider it a disqualification for admission to Indian Institute of Roorkee, Roorkee

- 1. Height (without shoes) Weight (with thin clothes)
- 2. Chest (over nipples) on complete expiration On full inspiration
- 3. Are gums and teeth healthy?
- 4. Any evidence of Adenitis, skin or venereal diseases
- 5. Any evidence of Epilepsy
- 6. Any signs of mental illness or drug addiction
- 7. Is the chest symmetrical and lungs normal?
- 8. Is the heart normal in size and sounds normal?
- 9. Blood pressure systolic Diastolic
- 10. Eye sight R/E L/E (Distance and near vision)
Does he/she use glasses and if so, Power of glass R/E L/E
 - 1. Reading.....
 - 2. Distant.....
- 11. Is there any other disease of eye including Colour/Night blindness? Is trauma present?
- 12. Any evidence of enlargement of Liver of Spleen or Anaemia present?

- 13. Is Hydrocele or Hernia present? If operated, is the scar healthy?
- 14. Urine RE
- 15. X-Ray Chest PA
- 16. ELISA test (foreign students and candidates who have visited a foreign country within the last 6 months)
- For Female candidates
Any evidence of gynecological disorder.....
Condition of Breasts/Uterus.....
Period of gestation (if pregnant).....

(Signature of Doctor)
Name and Designation

Part-Time Sponsored Candidates (Three years duration)**M.Tech (Part-Time)**

(a) These candidates must have a minimum of two years of full-time work experience till the last date of submission of application form in responsible capacity in a Registered Firm/Company/Industry/Educational and Research Institution/Govt./Quasi Govt./Autonomous Organization 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 turnover during the past 2 years exceeds Rs. 5.0 crores. For a candidate employed in an educational institution, it should be recognized by AICTE. Such organizations must be located either at Roorkee or within a radius of 20 km from Roorkee.

(B) The candidates seeking admission to programmes leading to M.Tech./M.Arch./M.U.R.P. including post M.Sc. but not qualified in GATE, may also be considered for admission to different academic programmes but their admission will be based on performance in an interview/Written Test to be held at IIT Roorkee. The candidates will be called for Interview/Written Test on the basis of their results of the qualifying degree. However, no self sponsored candidate will be admitted for part time study.

(c) There will not be any age restriction. However, preference will be given to those who are below 45 years of age.

(D) For admission to a postgraduate programme as a part-time student, a certificate from the Head of the Institution/Organization as per Appendix-III A must be submitted along with the application.

(E) For part-time students, the concerned academic department will draw up the detailed academic programme on an individual basis.

(f) The part-time students will be required to attend all lectures, tutorials and practical classes for the courses prescribed for them and must satisfy the attendance requirements.

(g) The part-time students will not be eligible for any scholarship, prize etc.

(h) The status of a part-time student will not be changed from part-time to a regular (full-time) student.

(i) Members of the Staff of the Indian Institute of Technology Roorkee seeking admission as part-time sponsored candidates should submit the sponsorship certificate from the Registrar and the Staff working in different projects in the Institute should submit the sponsorship certificate from the appointing authority. Preference in admission will be given to those candidates who are GATE qualified. Note: The candidates working in Institute/University awarding PG degree itself are not eligible for admission as part-time or full-time candidate, if facilities are not available except Q/P candidates.

**No Objection Certificate
(Required from candidates seeking admission on
part-time basis)**

The undersigned is pleased to permit Mr./Ms. Who is working in this organization for the last years and is presently holding the rank/position of for pursuing the PG Programme (course) at IIT Roorkee in the Department of With specialization in the following areas.

1. 2.
3. 4.

His/her conduct and character has been good.

The Institution/Organization would relieve him/her immediately for joining the above course, if selected for admission. If admitted the candidate will be permitted to be present at the Institute as required by the academic schedule for a period of three years and will continue to remain in service of this organization for the duration of the course.

Place

Date

Signature of Head of the
Institution/Organization with seal Name

Designation

APPENDIX - IV

Process of submitting the application for P.G. Diploma / M.Tech Degree Programme in WRD&M Department, Indian Institute of Technology - Roorkee (only for foreign candidates):

1. Eligible candidates must submit their duly filled-in application forms along with all relevant documents to Indian Missions / Embassies in their countries through their employers for admission to Post Graduate Diploma / M. Tech Degree Programmes in Water Resources Development (WRD) / Irrigation Water Management (IWM), for onward transmission to Ministry of External Affairs (MEA), ITBC, Govt. of India, New Delhi.

After receiving the application forms by MEA from the concerned Indian Missions / Embassies these application forms are sent to Department of Water Resources Development & Management (WRDM), Indian Institute of Technology Roorkee for checking the eligibility of candidates and confirming the admission.

The application form sent directly to the Department of WRDM, Indian Institute of Technology Roorkee (India) shall NOT be entertained.

2. Candidates are required to submit the following through e-mail "wrdr@iitrroorkee@gmail.com" to the Department of WRDM while applying to Indian Missions / Embassies in their countries.

(a) Duly filled Proforma given Appendix -V of the Information Brochure

(b) Scanned copies of all academic qualifications beginning from High School / Secondary mentioning clearly the percentage of marks / SGPA/CGPA or any other equivalent grade.

Note: The absolute % marks or equivalent must not be less than 60%. Please attach a copy of equivalence criteria.

(c) Experience certificate(s). **Note: The total experience at all levels must NOT be less than 02 years upto 15th June of the academic year.**

APPENDIX - V

PROFORMA FOR CHECKING ELIGIBILITY OF FOREIGN CANDIDATES ONLY
(to be e-mailed to "wrdr@iitrroorkee@gmail.com" along with all related documents while applying to Indian Embassy / Mission in their country)

1. Name of Candidate:

2. Educational Qualifications:

College/ Institution	Examination Passed	Year of Passing	% marks/Grade Point Average	Position/ Distinction
	High School/Secondary			
	Intermediate/Higher Secondary			

3. Name of University/ Institute awarding Bachelor of Science/Engg./Technology or any other equivalent Degree

4. Branch of Science/ Engg./Tech.: Civil / Elect./ Mech./ Agriculture or its equivalent

Details of Marks/Grade Secured; please attach Proof
(Note: Leave the column blank if not applicable)

Year	Semester	Marks %	Range of % Marks	Grade		Total /Average/ SGPA
				Letter	Figure	
	I					
	II					
	III					
	IV					
	V					
	VI					
	VII					
	VIII					
Total / Average / CGPA						

5. Employment Record and Experience: Please attach proof

Name of Department	Position Held	Period		Details of work done
		From (Exact Date/Year)	To (Exact Date/Year)	

(Candidate's Signature)

APPENDIX-VI

ESTIMATE OF EXPENSES
(For sponsored candidates only)

Approximate expenses under different heads are indicated below:

S.N	Particulars of Expenditure	Indian Officers	Foreign Officers on Fellowship from ITEC
For Ist and IInd Semester Training / P.G. Diploma / Master of Technology (First Year) 52 Weeks			
1.	Institute Fee*	Rs. 69,080	Rs. 66,000.00 (In Indian Rs.)
2.	Lodging & Electricity charges**	-	Rs. 50,000
3.	Books and stationery**	-	Rs. 5,000
4.	Study Tour and visits to projects	Rs. 5,000	Rs. 5,000
5.	Pick Up and Drop From Airport Expenses	-	Rs. 6000
	Sub Total	Rs. 73,080	Rs. 1,14,000 <i>Institute fee as applicable</i>
For IIIrd and IVth Semester Master of Technology (Second Year)			
6.	Institute Fee	Rs. 59,580	Rs. 59,580 (In Indian Rs.)
7.	Lodging and electricity charges**	-	Rs. 30,000
8.	Study tour and visits to project	5000	Rs. 5,000
	Sub Total	Rs. 64,580	Rs. 94,580 <i>Institute fee as applicable</i>
	Grand Total	Rs. 1,37,660	Rs. 2,11,460 <i>Institute fee as applicable</i>
<p>* Revision of Institute fee is under active consideration by the administration. The Institute fee includes: tuition, examination, enrolment, medical, internet, computer, extra curricular activity, and admission, grade card, student welfare, modernization, identity card, benevolent, alumni and library etc.</p> <p>** As per terms & conditions of sponsoring agency.</p>			
<p>Notes 1. Charges are to be deposited at the time of Registration in respective Semesters through a Demand Draft in favour of Chairman, P.G. Admission. IT. Receipts payable at any Nationalized Bank at Rooskee.</p> <p>2. In addition to above the boarding charges have to be borne by students/trainee officers themselves.</p> <p>3. Charges at Sl. No. 2 & 7 are for ITEC sponsored candidates/ICS sponsored candidates.</p>			