DEPARTMENT OF WATER RESOURCES DEVELOPMENT AND MANAGEMENT
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code   :   **XXX   M.Tech. (Drinking Water and Sanitation)/P.G. Diploma in Drinking Water and Sanitation**
Department   :   **Department of Water Resources Development and Management**
Year   :   **I**
Model   :   **2**

S.No.	Subject Code	Course Title	Subject Area	Credits	Contact Hours/Week			Exam Duration	
					L	T	P	Theory	Practical
		Semester-I (Autumn)							
1.	WRC-506	Rural and Urban Water Supply	PCC	4	3	0	2	3	0
2.	WRC-543	Drinking Water and Sanitation Sustainability	PCC	4	3	0	2	3	0
3.	WRC-546	Wastewater Engineering	PCC	3	2	0	2	3	0
4.	WRC-548	Water Sanitation, Hygiene, and Infrastructural Management	PCC	3	2	0	2	3	0
5.		Program Elective-I	PEC	3	-	-	-	-	-
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**19**					
		Semester-II (Spring)							
1.		Program Elective-II	PEC	3	-	-	-	-	-
2.		Program Elective-III	PEC	3	-	-	-	-	-
3.		Program Elective-IV	PEC	3	-	-	-	-	-
4.		Program Elective-V	PEC	3	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	WRC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**17**					
		Note: P.G. Diploma course in DWS shall be of One Year duration comprising of semesters I and II only, with a minimum credit of 36							

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Department   :   **Department of Water Resources Development and Management**
Year   :   **II**
Model   :   **2**

S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Teaching Scheme			**Contact Hours/Week**			**Exam Duration**	
		Semester-I (Autumn)							
1.	WRC-691	Internship Social Activity	ISA	4	-	-	-	-	-
2.	WRC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**14**					
		Semester-II (Spring)							
1.	WRC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	19	17	14	14
Total Credits	64			

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Program Elective Courses for Semester-I (Autumn)

S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Teaching Scheme			Contact Hours/Week			Exam Duration	
1.	WRL-601	Open Channel Hydraulics	PEC	3	2	0	2	3	0
2.	WRL-602	Data Analytics for Water Resources	PEC	3	2	0	2	2	1
3.	WRL-603	Smart Irrigation Systems	PEC	3	2	0	2	2	1
4.	WRL-604	Environmental Impact Assessment of Water Resources Project	PEC	3	3	0	0	3	0
5.	WRL-605	Circular Water Economy	PEC	3	3	0	0	3	0

Program Elective Courses for Semester-II (Spring)

S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Teaching Scheme			Contact Hours/Week			Exam Duration	
1.	WRL-613	System Design Techniques	PEC	3	2	1	0	3	0
2.	WRL-614	Sediment Transport in Rivers	PEC	3	2	1	0	3	0
3.	WRL-646	Renewable Energy System Technology	PEC	3	2	1	0	3	0
4.	WRL-647	Water Quality Monitoring and Modeling	PEC	3	2	1	0	3	0
5.	WRL-648	Groundwater Development and Management	PEC	3	2	1	0	3	0
6.	WRL-649	Watershed Development and Management	PEC	3	2	1	0	3	0
7.	WRL-650	Remote Sensing and GIS Applications in Water Systems	PEC	3	2	0	2	3	0
8.	WRL-651	Sustainable Water Resources	PEC	3	2	1	0	3	0
9.	WRL-652	Ecohydrological Modeling and Sustainability	PEC	3	2	0	2	3	0

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Program Elective Courses for Semester-II (Spring)

S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Teaching Scheme			**Contact Hours/Week**			**Exam Duration**	
10.	WRL-665	WASH: Field Methods and Community Engagement	PEC	3	1	0	4	1	2
11.	WRL-666	Drinking Water for Low-Income Societies	PEC	3	2	1	0	3	0
12.	WRL-667	Wastewater and Fecal Sludge Management	PEC	3	2	1	0	3	0
13.	WRL-668	Resilience, Shocks, and Engineering	PEC	3	2	1	0	3	0
14.	WRL-669	Management and Operation of Water Utilities	PEC	3	2	1	0	3	0
15.	WRL-670	Water and Wastewater Engineering	PEC	3	2	1	0	3	0
16.	WRL-671	Flow Hydraulics and Urban Drainage	PEC	3	2	1	0	3	0

Science, Technology, and Advanced Research-tools Basket

S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Teaching Scheme			**Contact Hours/Week**			**Exam Duration**	
1.	WRT-501	Artificial Intelligence (AI) & Machine Learning (ML) for Water Resources	STAR	3	2	0	2	2	1
2.	WRT-502	Automation in Water Resources Management	STAR	3	2	0	2	2	1

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Social Sciences Course Basket

S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
		Teaching Scheme			Contact Hours/Week			Exam Duration	
1.	WRS-501	Water and Society	SSC	2	2	0	0	2	0
2.	WRS-502	Policy and Strategies for DRR, Adaptation, Safety and Sustainability	SSC	2	2	0	0	2	0