DEPARTMENT OF HYDRO AND RENEWABLE ENERGY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Program Code : **XXX M.Tech. (Renewable and Hydro Energy)**
Department : **Department of Hydro and Renewable Energy**
Year : **I**
Model : **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
Semester-I (Autumn)									
1.	HRC-501	Hydro Power Planning and Management	PCC	4	3	1	0	3	0
2.	HRC-503	Renewable Energy Resources Development Technology	PCC	3	3	0	0	3	0
3.	HRC-505	Grid Integration of Renewable Energy	PCC	3	3	0	0	3	0
4.	HRC-507	Renewable and Hydro Energy Lab.	PCC	3	0	0	6	0	3
5.	HRC-509	Finance, Policy and Regulations for Renewable Energy	PCC	3	3	0	0	3	0
6.		Social Science Course	SSC	2	-	-	-	-	-
		Total		**18**					
Semester-II (Spring)									
1.		Program Elective-I	PEC	4	-	-	-	-	-
2.		Program Elective-II	PEC	4	-	-	-	-	-
3.		Program Elective-III	PEC	4	-	-	-	-	-
4.		Program Elective-IV	PEC	4	-	-	-	-	-
5.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
6.	HRC-700	Seminar	SEM	2	-	-	-	-	-
		Total		**21**					

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Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	**Subject Code**	**Course Title**	**Subject Area**	**Credits**	**L**	**T**	**P**	**Theory**	**Practical**
Semester-I (Autumn)									
1.	HRC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	HRC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		Total		**13**					
Semester-II (Spring)									
1.	HRC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		Total		**14**					

Summary				
Semester	**1**	**2**	**3**	**4**
Semester-wise Total Credits	18	21	13	14
Total Credits	**66**			

M.Tech. (Renewable and Hydro Energy)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HRL-511	Hydro Electric Equipment	PEC	4	3	1	2/2	3	0
2.	HRL-512	Design of Hydropower Structures	PEC	4	3	1	0	3	0
3.	HRL-513	Hydro mechanical Equipment	PEC	4	3	1	2/2	3	0
4.	HRL-514	Modelling, Simulation and Computer Applications	PEC	4	3	1	2/2	3	0
5.	HRL-503	Environmental Planning and Management	PEC	4	3	1	0	3	0
6.	HRL-515	Wind Energy Application Technology	PEC	4	3	1	0	3	0
7.	HRL-516	Instrumentation for Hydro Power Plants	PEC	4	3	1	2/2	3	0
8.	HRL-517	Rural Electrical Energy System Planning and Design	PEC	4	3	1	0	3	0
9.	HRL-518	Remote Sensing and GIS for Renewable Energy Planning	PEC	4	3	0	2	3	0
10.	HRL-519	Construction Planning and Management	PEC	4	3	1	0	3	0
11.	HRL-520	Biomass, Bioenergy and Biofuels	PEC	4	3	1	0	3	0
12.	HRL-521	Solar Photo-Voltaic Design and Application	PEC	4	3	1	0	3	0
13.	HRL-522	Energy Conservation and Management	PEC	4	3	1	0	3	0
14.	HRL-523	Climate Change and Water Resources	PEC	4	3	1	0	3	0
15.	HRL-502	Energy-water-food Nexus	PEC	4	3	1	0	3	0
16.	HRL-524	Electric Vehicular Technology	PEC	4	3	1	0	3	0
17.	HRL-525	Energy Storage Systems	PEC	4	3	1	0	3	0
18.	HRL-526	Hydrogen Technology and Economy	PEC	4	3	1	2/2	3	0
19.	HRL-527	Advanced Modelling for Renewable Energy Power Systems	PEC	4	3	1	2/2	3	0

M.Tech. (Renewable and Hydro Energy)

Science, Technology, and Advanced Research-tools Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HRT-501	Modeling of Turbulence in Turbines	STAR	3	3	0	0	3	0
2.	HRT-502	System Dynamics Modelling	STAR	3	3	0	0	3	0
3.	HRT-503	Modeling and Stability Analysis of DC-DC Converters	STAR	3	3	0	0	3	0
4.	HRT-504	Quantitative Investigations of Flows	STAR	3	3	0	0	3	0

Social Sciences Course Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	HRS-501	Environmental and Social Sustainability	SSC	2	2	0	0	2	0
2.	HRS-502	Energy Economics	SSC	2	2	0	0	2	0