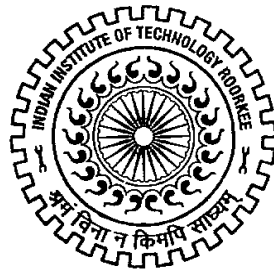


**DEPARTMENT OF HYDROLOGY
INDIAN INSTITUTE OF TECHNOLOGY
ROORKEE**

P.G. Diploma / M. Tech. (Hydrology)

CURRICULUM STRUCTURE



JANUARY 2006

DEPARTMENT OF HYDROLOGY, IIT, ROORKEE
P.G. Diploma / M. Tech. (Hydrology)

New Curriculum Structure

Sl.No. Course Components	Credit
(I) <u>P.G. Diploma (duration 12 months)</u>	
(See Annexures I and II)	
1. Advanced Course on Mathematics	4
2. Course on Computer Applications	4
3. Departmental Core Courses	4
4. Courses on Major area of Specialisation	24
5. Courses on Minor area of Specialisation	8
6. Project	4
(Project would commence on April 1 every year. The project will end one week before the termination of the P.G. Diploma course)	
	48
Total credit requirement for P.G. Diploma	= 48 credits
(Course will commence with effect from the date of starting of academic session of IIT and its duration will be one year.)	
(II) <u>M.Tech.(Hydrology)</u>	
A. Semesters 1 and 2 + summer term as per I.	48
B-I. Semesters 3	
1. Seminar with write up	4
2. Dissertation	16
	20
B-II Semester 4	
1. Dissertation	20
	40
TOTAL Semester 3 and 4	40
Total credit requirement for M.Tech. (48 + 40)	= 88 credits

DEPARTMENT OF HYDROLOGY, IIT, ROORKEE
SCHEME OF TEACHING (Semesters 1 and 2)
P.G. Diploma/M.Tech.(Hydrology)
(Surface Water)

S.N.	No.	Title	Credits	Contact Hours		
				L	T	P
i.	MA 501 B	Mathematics	4	3	1	0
ii.	HY 512	Computer Applications	4	2	1	2
iii.	Departmental core course					
	HY 511	Hydrologic Elements and Analysis	4	3	1	0
iv.	Courses on major specialization					
1.	HY 518	Water Resources Planning and Management	4	3	1	0
2.	HY 522	Stochastic Hydrology	4	3	1	0
3.	HY 525	System Analysis and Surface Water Planning	4	3	1	0
4.	HY 526	Parametric Hydrology	4	3	1	0
5.	HY 538	Hydrological Data Collection Processing & Analysis	4	3	1	0
6.	HY 540	Water Resources Economics	4	3	1	0
v.	Courses on minor area of specialization*					
	Elective courses		8			
	<i>(to be decided in consultation with the faculty advisor)</i>					
1.	HY 513	Hydrometeorology	4	3	1	0
2.	HY 514	Hydrogeology	4	3	1	0
3.	HY 516	Channel and Fluvial Hydraulics	4	3	1	0
4.	HY 524	Geohydrology	4	3	½	2/2
5.	HY 527	Groundwater Hydrology	4	3	1	0
6.	HY 529	Geophysical Investigations	4	3	½	2/2
7.	HY 531	Watershed Behaviour and Conservation Practices	4	3	1	0
8.	HY 532	System Ecology and Environmental Planning	4	3	1	0
9.	HY 535	Water Quality & Environment	4	3	½	2/2
10.	HY 537	Remote Sensing & GIS Applications in Hydrology	4	3	½	2/2
11.	HY 539	Nuclear Methods in Hydrology	4	3	1	0
12.	HY 541	Forest & Agricultural Hydrology	4	3	1	0
13.	HY 542	Urban Hydrology	4	3	1	0
14.	HY 543	Flood Forecasting	4	3	1	0
15.	HY 544	Hydrogeology of Hard Rocks	4	3	1	0
16.	HY 545	Water Quality Modelling	4	3	1	0
17.	HY 546	Hydroinformatics	4	3	1	0
18.	HY 547	Geomorphology	4	3	1	0
19.	Selected relevant P.G. courses from other departments as deemed fit by the A.P.C.					
vi.	Project		4			
	TOTAL		48 Credits	<i>(minimum requirement)</i>		

Note: HS 501 (it is an optional subject and will be run by Humanities and Social Sciences Department with 2 credits).

DEPARTMENT OF HYDROLOGY, IIT, ROORKEE
SCHEME OF TEACHING (Semesters 1 and 2)
P.G. Diploma/M.Tech.(Hydrology)
(Ground Water)

S.N.	No.	Title	Credits	Contact Hours		
				L	T	P
i.	MA 501 B	Mathematics	4	3	1	0
ii.	HY 512	Computer Applications	4	2	1	2
iii.	Departmental core course					
	HY 511	Hydrologic Elements and Analysis	4	3	1	0
iv	Courses on Major specialisation					
1.	HY 514	Hydrogeology	4	3	1	0
2.	HY 527	Groundwater Hydrology	4	3	1	0
3.	HY 528	Systems Analysis and Ground Water System	4	3	1	0
4.	HY 529	Geophysical Investigations	4	3	½	2/2
5.	HY 535	Water Quality and Environment	4	3	½	2/2
6.	HY 537	Remote Sensing & GIS Applications in Hydrology	4	3	½	2/2
v.	Courses on Minor area of Specialisation :					
	Elective courses		8			
	<i>(to be decided in consultation with the faculty advisor)</i>					
1.	HY 513	Hydrometeorology	4	3	1	0
2.	HY 516	Channel & Fluvial Hydraulics	4	3	1	0
3.	HY 518	Water Resources Planning & Management	4	3	1	0
4.	HY 522	Stochastic Hydrology	4	3	1	0
5.	HY 526	Parametric Hydrology	4	3	1	0
6.	HY 531	Watershed Behaviour & Conservation Practices	4	3	1	0
7.	HY 532	System Ecology & Environmental Planning	4	3	1	0
8.	HY 538	Hydrological Data Collection Processing & Analysis	4	3	1	0
9.	HY 539	Nuclear Methods in Hydrology	4	3	1	0
10.	HY 540	Water Resources Economics	4	3	1	0
11.	HY 541	Forest & Agricultural Hydrology	4	3	1	0
12.	HY 542	Urban Hydrology	4	3	1	0
13.	HY 543	Flood Forecasting	4	3	1	0
14.	HY 544	Hydrogeology of Hard Rocks	4	3	1	0
15.	HY 545	Water Quality Modelling	4	3	1	0
16.	HY 546	Hydroinformatics	4	3	1	0
17.	HY 547	Geomorphology	4	3	1	0
18.	-	Selected relevant P.G. Courses from other departments as deemed fit by A.P.C.				
vi.	Project		4			
	TOTAL		48 Credits	<i>(minimum requirement)</i>		

Note: HS 501 (it is an optional subject and will be run by Humanities and Social Sciences Department with 2 credits).

DEPARTMENT OF HYDROLOGY, IIT, ROORKEE
SCHEME OF TEACHING (Semesters 1 and 2)
P.G. Diploma/M.Tech.(Hydrology)
(Watershed Management)

S.N.	No.	Title	Credits	Contact Hours		
				L	T	P
i.	MA 501 B	Mathematics	4	3	1	0
ii.	HY 512	Computer Applications	4	2	1	2
iii.	Departmental core course					
	HY 511	Hydrologic Elements and Analysis	4	3	1	0
iv.	Courses on major specialization					
1.	HY 513	Hydrometeorology	4	3	1	0
2.	HY 516	Channel and Fluvial Hydraulics	4	3	1	0
3.	HY 530	Planning and Management of Watersheds	4	3	1	0
4.	HY 531	Watershed Behavior and Conservation Practices	4	3	1	0
5.	HY 532	System Ecology and Environmental Planning	4	3	1	0
6.	HY 537	Remote Sensing and GIS applications in Hydrology	4	3	½	2/2
v.	Courses on minor area of specialization*					
	Elective courses		8			
	<i>(to be decided in consultation with the faculty advisor)</i>					
1.	HY 514	Hydrogeology	4	3	1	0
2.	HY 518	Water Resources Planning & Management	4	3	1	0
3.	HY 522	Stochastic Hydrology	4	3	1	0
4.	HY 524	Geohydrology	4	3	½	2/2
5.	HY 526	Parametric Hydrology	4	3	1	0
6.	HY 527	Groundwater Hydrology	4	3	1	0
7.	HY 529	Geophysical Investigation	4	3	½	2/2
8.	HY 535	Water Quality and Environment	4	3	½	2/2
9.	HY 538	Hydrological Data Collection and Processing	4	3	1	0
10.	HY 539	Nuclear Methods in Hydrology	4	3	1	0
11.	HY 540	Water Resources Economics	4	3	1	0
12.	HY 541	Forest & Agricultural Hydrology	4	3	1	0
13.	HY 542	Urban Hydrology	4	3	1	0
14.	HY 543	Flood Forecasting	4	3	1	0
15.	HY 544	Hydrogeology of Hard Rocks	4	3	1	0
16.	HY 545	Water Quality Modelling	4	3	1	0
17.	HY 546	Hydroinformatics	4	3	1	0
18.	HY 547	Geomorphology	4	3	1	0
19.	-	Selected relevant P.G. Courses from the departments as deemed fit by the A.P.C.				
vi.	Project		4			
	TOTAL		48 Credits	<i>(minimum requirement)</i>		

Note: HS 501 (it is an optional subject and will be run by Humanities and Social Sciences Department with 2 credits).

DEPARTMENT OF HYDROLOGY, IIT, ROORKEE
Scheme of Teaching : P.G. Diploma/M.Tech.(Hydrology)

Specialization: Surface water

Semester I

Course no.	Course title	Credit	Contact hours per week		
			L	T	P
MA 501 B	Mathematics	4	3	1	0
HY 511	Hydrologic Elements and Analysis	4	3	1	0
HY 512	Computer Applications	4	2	1	2
	<i>Courses on major specialization</i>				
HY 518	Water Resources Planning and Management	4	3	1	0
HY 538	Hydrological Data Collection Processing & Analysis	4	3	1	0
	<i>Courses on minor area of specialization**</i>				
	<i>Elective courses (Any one)</i>	4			
	TOTAL	24			

Semester II

	<i>Courses on major specialization</i>				
HY 522	Stochastic Hydrology	4	3	1	0
HY 525	System Analysis and Surface Water Planning	4	3	1	0
HY 526	Parametric Hydrology	4	3	1	0
HY 540	Water Resources Economics	4	3	1	0
	Project	4			
	<i>Courses on minor area of specialization**</i>				
	<i>Elective courses (Any one)</i>	4			
	TOTAL	24			
	List of Elective Courses				
HY 513	Hydrometeorology	4	3	1	0
HY 514	Hydrogeology	4	3	1	0
HY 516	Channel and Fluvial Hydraulics	4	3	1	0
HY 524	Geohydrology*	4	3	1/2	2/2
HY 527	Groundwater Hydrology	4	3	1	0
HY 529	Geophysical Investigations	4	3	0	2
HY 531	Watershed Behaviour and Conservation Practices	4	3	1	0
HY 532	System Ecology and Environmental Planning	4	3	1	0
HY 535	Water Quality & Environment	4	3	1/2	2/2
HY 537	Remote Sensing & GIS Applications in Hydrology	4	3	1/2	2/2
HY 539	Nuclear Methods in Hydrology	4	3	1	0
HY 541	Forest & Agricultural Hydrology	4	3	1	0
HY 542	Urban Hydrology	4	3	1	0
HY 543	Flood Forecasting	4	3	1	0
HY 544	Hydrogeology of Hard Rocks	4	3	1	0
HY 545	Water Quality Modelling	4	3	1	0
HY 546	Hydroinformatics	4	3	1	0
HY 547	Geomorphology	4	3	1	0

Total credit : 48 (minimum) in I & II semesters (for P.G. Diploma)

* Geohydrology can only be taken if any of the following course is not taken as MINOR:

Groundwater hydrology/Hydrogeology/Geophysical Investigation.

** Total Minimum credits in Minor area of specialization in I & II semesters = 8

Note: HS 501 (it is an optional subject and will be run by Humanities and Social Sciences Department with 2 credits).

**DEPARTMENT OF HYDROLOGY, IIT, ROORKEE
Scheme of Teaching : P.G. Diploma/M.Tech.(Hydrology)**

**Specialization: Groundwater
Semester I**

Course no.	Course title	Credit	Contact hours per week		
			L	T	P
MA 501B	Mathematics	4	3	1	0
HY 511	Hydrologic Elements and Analysis	4	3	1	0
HY 512	Computer Applications	4	2	1	2
	<i>Courses on major specialization</i>				
HY 514	Hydrogeology	4	3	1	0
HY 529	Geophysical Investigation	4	3	1/2	2/2
	<i>Courses on Minor area of specialization**</i>				
	<i>Elective courses (Any one)</i>	4			
	TOTAL	24			

Semester II

	<i>Courses on major specialization</i>				
HY 527	Groundwater Hydrology	4	3	1	0
HY 528	Systems Analysis & Groundwater System	4	3	1	0
HY 535	Water Quality & Environment	4	3	1/2	2/2
HY 537	Remote Sensing & GIS Applications in Hydrology	4	3	1/2	2/2
	Project	4			
	<i>Courses on minor area of specialization**</i>				
	<i>Elective courses (Any one)</i>	4			
	TOTAL	24			
	List of Elective Courses				
HY 513	Hydrometeorology	4	3	1	0
HY 516	Channel & Fluvial Hydraulics	4	3	1	0
HY 518	Water Resources Planning & Management	4	3	1	0
HY 522	Stochastic Hydrology	4	3	1	0
HY 526	Parametric Hydrology	4	3	1	0
HY 531	Watershed Behaviour & Conservation Practices	4	3	1	0
HY 532	System Ecology & Environmental Planning	4	3	1	0
HY 538	Hydrological Data Collection Processing & Analysis	4	3	1	0
HY 539	Nuclear Methods in Hydrology	4	3	1	0
HY 540	Water Resources Economics	4	3	1	0
HY 541	Forest & Agricultural Hydrology	4	3	1	0
HY 542	Urban Hydrology	4	3	1	0
HY 543	Flood Forecasting	4	3	1	0
HY 544	Hydrogeology of Hard Rocks	4	3	1	0
HY 545	Water Quality Modelling	4	3	1	0
HY 546	Hydroinformatics	4	3	1	0
HY 547	Geomorphology	4	3	1	0

Total credit : 48 (minimum) in I & II semesters (for P.G. Diploma)

** Total Minimum credits required in Minor area of specialization in I & II semesters = 8

Note: HS 501 (it is an optional subject and will be run by Humanities and Social Sciences Department with 2 credits).

**DEPARTMENT OF HYDROLOGY, IIT, ROORKEE
Scheme of Teaching : P.G. Diploma/M.Tech.(Hydrology)**

**Specialization: Watershed Management
Semester I**

Course no.	Course title	Credit	Contact hours per week		
			L	T	P
MA 501B	Mathematics	4	3	1	0
HY 511	Hydrologic Elements and Analysis	4	3	1	0
HY 512	Computer Applications	4	2	1	2
	<i>Courses on major specialization</i>				
HY 516	Channel & Fluvial Hydraulics	4	3	1	0
HY 531	Watershed Behaviour & Conservation Practices	4	3	1	0
	<i>Courses on minor area of specialization**</i>				
	<i>Elective Courses (Any one)</i>	4			
	TOTAL	24			

Semester II

	<i>Courses on major specialization</i>				
HY 513	Hydrometeorology	4	3	1	0
HY 530	Planning & Management of Watersheds	4	3	1	0
HY 532	System Ecology & Environmental Planning	4	3	1	0
HY 537	Remote Sensing & GIS Applications in Hydrology	4	3	1/2	2/2
	Project	4			
	<i>Courses on Minor area of Specialization**</i>				
	<i>Elective courses (Any one)</i>	4			
	TOTAL	24			
	List of Elective Courses				
HY 514	Hydrogeology	4	3	1	0
HY 518	Water Resources Planning & Management	4	3	1	0
HY 522	Stochastic Hydrology	4	3	1	0
HY 524	Geohydrology*	4	3	1/2	2/2
HY 526	Parametric Hydrology	4	3	1	0
HY 527	Groundwater Hydrology	4	3	1	0
HY 529	Geophysical Investigation	4	3	1/2	2/2
HY 535	Water Quality and Environment	4	3	1/2	2/2
HY 538	Hydrological Data Collection and Processing	4	3	1	0
HY 539	Nuclear Methods in Hydrology	4	3	1	0
HY 540	Water Resources Economics	4	3	1	0
HY 541	Forest & Agricultural Hydrology	4	3	1	0
HY 542	Urban Hydrology	4	3	1	0
HY 543	Flood Forecasting	4	3	1	0
HY 544	Hydrogeology of Hard Rocks	4	3	1	0
HY 545	Water Quality Modelling	4	3	1	0
HY 546	Hydroinformatics	4	3	1	0
HY 547	Geomorphology	4	3	1	0

Total Credits : 48 (minimum) in I & II Semesters (for P.G. Diploma)

*Geohydrology can only be taken if any of the following course is not taken as minor :

Ground water hydrology/Hydrogeology/Geophysical Investigation

**Total Minimum Credits in Minor area of specialization in I & II semester = 8

Note: HS 501 (it is an optional subject and will be run by Humanities and Social Sciences Department with 2 credits).