

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

Program Code: **XXX M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology**
 Department: **Department of Hydrology**
 Year: **1**
 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. | HYC-501 | Open Channel and Fluvial Hydraulics | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 2. | HYC-503 | Stochastic Hydrology | PCC | 3 | 2 | 1 | 0 | 3 | 0 |
| 3. | HYC-505 | Remote Sensing and GIS Applications | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 4. | HYC-507 | Deterministic Hydrology | PCC | 3 | 2 | 1 | 0 | 3 | 0 |
| 5. | HYC-509 | Surface Water Quality Modelling | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 6. | | Social Science Course | SSC | 2 | - | - | - | - | - |
| | | Total | | 17 | | | | | |
| Semester-II (Spring) | | | | | | | | | |
| 1. | | Program Elective-I | PEC | 3 | - | - | - | - | - |
| 2. | | Program Elective-II | PEC | 3 | - | - | - | - | - |
| 3. | | Program Elective-III | PEC | 3 | - | - | - | - | - |
| 4. | | Program Elective-IV | PEC | 3 | - | - | - | - | - |
| 5. | | Program Elective-V | PEC | 3 | - | - | - | - | - |
| 6. | | Science, Technology, and Advanced Research-tools | STAR | 3 | - | - | - | - | - |
| 7. | HYC-700 | Seminar | SEM | 2 | - | - | - | - | - |
| | | Total | | 20 | | | | | |


 डॉ० सुमित सेन / Dr. Sumit Sen
 प्राध्यापक एवं विभागाध्यक्ष / Professor & Head
 जल विज्ञान विभाग / Department of Hydrology
 भारतीय प्रौद्योगिकी संस्थान रुड़की

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

Program Code: **XXX M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology**
 Department: **Department of Hydrology**
 Year: **II**
 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. | HYC-691 | Internship Social Activity | ISA | 5 | - | - | - | - | - |
| 2. | HYC-701A | Thesis Stage-I | THESIS | 10 | - | - | - | - | - |
| Total | | | | 15 | | | | | |
| Semester-II (Spring) | | | | | | | | | |
| 1. | HYC-701B | Thesis Stage-II | THESIS | 14 | - | - | - | - | - |
| Total | | | | 14 | | | | | |

| Summary | | | | |
|-----------------------------|-----------|----|----|----|
| Semester | 1 | 2 | 3 | 4 |
| Semester-wise Total Credits | 17 | 20 | 15 | 14 |
| Total Credits | 66 | | | |

M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology
Program Elective Courses

| S.No. | Subject Code | Course Title | Subject Area | Credits | Teaching Scheme | | | Exam Duration | |
|-------|--------------|---|--------------|---------|-----------------|---|---|---------------|-----------|
| | | | | | L | T | P | Theory | Practical |
| 1. | HYL-501 | Water Resources Planning and Management | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 2. | HYL-502 | Urban Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 3. | HYL-503 | Irrigation and Drainage Engineering | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 4. | HYL-504 | Geophysical Investigations | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 5. | HYL-505 | Surface Water Modelling and Simulation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 6. | HYL-506 | Soil and Groundwater Contamination Modelling | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 7. | HYL-507 | Hydrometeorology and Climate Change | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 8. | HYL-508 | Vadose Zone Hydrology | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 9. | HYL-509 | Ecohydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 10. | HYL-510 | Membranes for Desalination and Purification | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 11. | HYL-511 | Hydrological Data Collection and Processing | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 12. | HYL-512 | Numerical Methods in Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 13. | HYL-513 | Environmental Planning and Assessment of Projects | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 14. | HYL-514 | Soil and Water Remediation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 15. | HYL-515 | Hydrogeochemistry | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 16. | HYL-516 | Soft Computing Techniques | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 17. | HYL-517 | Multi-phase Flow through Porous Media | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 18. | HYL-518 | Hydro-informatics | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 19. | HYL-519 | Watershed Modelling and Simulation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 20. | HYL-520 | Isotope Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |

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M.Tech. (Surface Water Hydrology)/PG Diploma in Surface Water Hydrology

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. | HYT-501 | Data Analysis and Numerical Modelling | STAR | 3 | 2 | 1 | 0 | 3 | 0 |

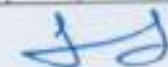
Social Science Course Basket

| Teaching Scheme | | | | | Contact Hours/Week | | | Exam Duration | |
|-----------------|--------------|--|--------------|---------|--------------------|---|---|---------------|-----------|
| S.No. | Subject Code | Course Title | Subject Area | Credits | L | T | P | Theory | Practical |
| 1. | HYS-501 | Natural Resources, Society and Environment | SSC | 2 | 2 | 0 | 0 | 2 | 0 |
| 2. | HYS-502 | Rural Water Supply and Sanitation | SSC | 2 | 2 | 0 | 0 | 2 | 0 |

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

Program Code: **XXX M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology**
 Department: **Department of Hydrology**
 Year: **1**
 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. | HYC-505 | Remote Sensing and GIS Applications | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 2. | HYC-511 | Groundwater Hydrology | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 3. | HYC-513 | Environmental Quality | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 4. | HYC-515 | Hydrologic Elements and Analysis | PCC | 3 | 2 | 1 | 0 | 3 | 0 |
| 5. | HYC-517 | Systems Analysis and Applications in Hydrology | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 6. | | Social Science Course | SSC | 2 | - | - | - | - | - |
| | | Total | | 17 | | | | | |
| Semester-II (Spring) | | | | | | | | | |
| 1. | | Program Elective-I | PEC | 3 | - | - | - | - | - |
| 2. | | Program Elective-II | PEC | 3 | - | - | - | - | - |
| 3. | | Program Elective-III | PEC | 3 | - | - | - | - | - |
| 4. | | Program Elective-IV | PEC | 3 | - | - | - | - | - |
| 5. | | Program Elective-V | PEC | 3 | - | - | - | - | - |
| 6. | | Science, Technology, and Advanced Research-tools | STAR | 3 | - | - | - | - | - |
| 7. | HYC-700 | Seminar | SEM | 2 | - | - | - | - | - |
| | | Total | | 20 | | | | | |



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

Program Code: **XXX M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology**
 Department: **Department of Hydrology**
 Year: **II**
 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. | HYC-691 | Internship Social Activity | ISA | 5 | - | - | - | - | - |
| 2. | HYC-701A | Thesis Stage-I | THESIS | 10 | - | - | - | - | - |
| | | Total | | 15 | | | | | |
| Semester-II (Spring) | | | | | | | | | |
| 1. | HYC-701B | Thesis Stage-II | THESIS | 14 | - | - | - | - | - |
| | | Total | | 14 | | | | | |

| Summary | | | | |
|-----------------------------|-----------|----|----|----|
| Semester | 1 | 2 | 3 | 4 |
| Semester-wise Total Credits | 17 | 20 | 15 | 14 |
| Total Credits | 66 | | | |

M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology
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. | HYL-501 | Water Resources Planning and Management | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 2. | HYL-502 | Urban Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 3. | HYL-503 | Irrigation and Drainage Engineering | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 4. | HYL-504 | Geophysical Investigations | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 5. | HYL-505 | Surface Water Modelling and Simulation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 6. | HYL-506 | Soil and Groundwater Contamination Modelling | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 7. | HYL-507 | Hydrometeorology and Climate Change | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 8. | HYL-508 | Vadose Zone Hydrology | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 9. | HYL-509 | Ecohydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 10. | HYL-510 | Membranes for Desalination and Purification | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 11. | HYL-511 | Hydrological Data Collection and Processing | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 12. | HYL-512 | Numerical Methods in Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 13. | HYL-513 | Environmental Planning and Assessment of Projects | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 14. | HYL-514 | Soil and Water Remediation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 15. | HYL-515 | Hydrogeochemistry | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 16. | HYL-516 | Soft Computing Techniques | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 17. | HYL-517 | Multi-phase Flow through Porous Media | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 18. | HYL-518 | Hydro-informatics | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 19. | HYL-519 | Watershed Modelling and Simulation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 20. | HYL-520 | Isotope Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |

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M.Tech. (Ground Water Hydrology)/P.G. Diploma in Ground Water Hydrology

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. | HYT-501 | Data Analysis and Numerical Modelling | STAR | 3 | 2 | 1 | 0 | 3 | 0 |

Social Science Course Basket

| Teaching Scheme | | | | | Contact Hours/Week | | | Exam Duration | |
|-----------------|--------------|--|--------------|---------|--------------------|---|---|---------------|-----------|
| S.No. | Subject Code | Course Title | Subject Area | Credits | L | T | P | Theory | Practical |
| 1. | HYS-501 | Natural Resources, Society and Environment | SSC | 2 | 2 | 0 | 0 | 2 | 0 |
| 2. | HYS-502 | Rural Water Supply and Sanitation | SSC | 2 | 2 | 0 | 0 | 2 | 0 |

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

Program Code: XXX M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management
 Department: Department of Hydrology
 Year: 1
 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. | HYC-509 | Surface Water Quality Modelling | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 2. | HYC-511 | Groundwater Hydrology | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 3. | HYC-515 | Hydrologic Elements and Analysis | PCC | 3 | 2 | 1 | 0 | 3 | 0 |
| 4. | HYC-517 | Systems Analysis and Applications in Hydrology | PCC | 3 | 2 | 0 | 2 | 3 | 0 |
| 5. | HYC-521 | Watershed Behaviour and Conservation Practices | PCC | 3 | 2 | 1 | 0 | 3 | 0 |
| 6. | | Social Science Course | SSC | 2 | - | - | - | - | - |
| | | Total | | 17 | | | | | |
| Semester-II (Spring) | | | | | | | | | |
| 1. | | Program Elective-I | PEC | 3 | - | - | - | - | - |
| 2. | | Program Elective-II | PEC | 3 | - | - | - | - | - |
| 3. | | Program Elective-III | PEC | 3 | - | - | - | - | - |
| 4. | | Program Elective-IV | PEC | 3 | - | - | - | - | - |
| 5. | | Program Elective-V | PEC | 3 | - | - | - | - | - |
| 6. | | Science, Technology, and Advanced Research-tools | STAR | 3 | - | - | - | - | - |
| 7. | HYC-700 | Seminar | SEM | 2 | - | - | - | - | - |
| | | Total | | 20 | | | | | |

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

Program Code: **XXX M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management**
 Department: **Department of Hydrology**
 Year: **II**
 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. | HYC-691 | Internship Social Activity | ISA | 5 | - | - | - | - | - |
| 2. | HYC-701A | Thesis Stage-I | THESIS | 10 | - | - | - | - | - |
| Total | | | | 15 | | | | | |
| Semester-II (Spring) | | | | | | | | | |
| 1. | HYC-701B | Thesis Stage-II | THESIS | 14 | - | - | - | - | - |
| Total | | | | 14 | | | | | |

| Summary | | | | |
|-----------------------------|-----------|----|----|----|
| Semester | 1 | 2 | 3 | 4 |
| Semester-wise Total Credits | 17 | 20 | 15 | 14 |
| Total Credits | 66 | | | |

M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management
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. | HYL-501 | Water Resources Planning and Management | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 2. | HYL-502 | Urban Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 3. | HYL-503 | Irrigation and Drainage Engineering | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 4. | HYL-504 | Geophysical Investigations | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 5. | HYL-505 | Surface Water Modelling and Simulation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 6. | HYL-506 | Soil and Groundwater Contamination Modelling | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 7. | HYL-507 | Hydrometeorology and Climate Change | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 8. | HYL-508 | Vadose Zone Hydrology | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 9. | HYL-509 | Ecohydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 10. | HYL-510 | Membranes for Desalination and Purification | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 11. | HYL-511 | Hydrological Data Collection and Processing | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 12. | HYL-512 | Numerical Methods in Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 13. | HYL-513 | Environmental Planning and Assessment of Projects | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 14. | HYL-514 | Soil and Water Remediation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 15. | HYL-515 | Hydrogeochemistry | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 16. | HYL-516 | Soft Computing Techniques | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 17. | HYL-517 | Multi-phase Flow through Porous Media | PEC | 3 | 2 | 1 | 0 | 3 | 0 |
| 18. | HYL-518 | Hydro-informatics | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 19. | HYL-519 | Watershed Modelling and Simulation | PEC | 3 | 2 | 0 | 2 | 3 | 0 |
| 20. | HYL-520 | Isotope Hydrology | PEC | 3 | 2 | 1 | 0 | 3 | 0 |

M.Tech. (Watershed Management)/P.G. Diploma in Watershed Management

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. | HYT-501 | Data Analysis and Numerical Modelling | STAR | 3 | 2 | 1 | 0 | 3 | 0 |

Social Science Course Basket

| Teaching Scheme | | | | | Contact Hours/Week | | | Exam Duration | |
|-----------------|--------------|--|--------------|---------|--------------------|---|---|---------------|-----------|
| S.No. | Subject Code | Course Title | Subject Area | Credits | L | T | P | Theory | Practical |
| 1. | HYS-501 | Natural Resources, Society and Environment | SSC | 2 | 2 | 0 | 0 | 2 | 0 |
| 2. | HYS-502 | Rural Water Supply and Sanitation | SSC | 2 | 2 | 0 | 0 | 2 | 0 |