**II.2.9 HYDROLOGY**

**A . Course description:**

**1. Credit points: 3 ECTS**

**2. Time commitment**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Items | Lecture | Tutorial/Exercise | Practice/Assignment | Lab-work | Total |
| No. of hours | 15 | 10 | 5 |  | 30 |

**3. Prerequisites**

N/A

**4. Recommended background knowledge**

N/A

**5. Assessment/ Evaluation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Component | Attendance | Tutorial/Exercise | Practice | Midterm | Final |
| Percentage % | 05 | 20 | 15 |  | 60 |

**8. Prescribed Textbook(s)**

**B. Course content**

1 Hydrosphere: Hydrological cycle, Climate and water availability, Water balance

2 Watersheds: Watershed characteristics and classification, quantitative characteristics of drainage basin, streams, subsurface environment and flood plains, time of concentration

3 Precipitation: Meterology, weather systems, mechanisms and types of precipitation, measurement and analysis, mean areal precipitation, IDF curves

4 Evapotranspiration: Evaporation process, factors affecting evaporation, measurement of evaporation, Transpiration process, measurement of transpiration, measurement & determination of evapotranspiration

5 Infiltration: Process, factors affecting infiltration, measurement, analytical models

6 Soil moisture: Processes and behavior, measurement, analytical methods

7 Stream flow: Measurement, stream flow hydrograph, hydrograph analysis, rainfall-runoff relationships, reservoir water storage

8 Basic hydrogeology and groundwater: Occurrence and movement of groundwater, stream-aquifer interaction, base flow, well hydraulics

9 Urban hydrology: Processes, land-use impacts, storm water and management

10 Flood routing and control: Theory, routing methods

**C. Reference Literature:**

[1]. V. P. Singh. Elementary Hydrology, Prentice-Hall Inc., 1992, 973p.

[2]. C.S.P. Ojha, R. Berndtsson, P. Bhunya. Engineering hydrology. Oxford University Press, 2008, 445p.

[3]. Robert G. Wetzel. Limnology, Third Edition: Lake and River Ecosystems. Elsevier Edition, 2001. ISBN-13: 978-0127447605

[4]. Alexander J. Horne, Charles R. Goldman. Limnology second edition. International Editions 1994. ISBN-13 978-0070236738.