SECOND SEMESTER 2015-2016

Course Handout (Part II)

Date 12/01/2016

In addition to Part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No : **CE F341**
Course Title : **Hydrology and Water Resources Engineering**
Instructor-in-charge : **SHIBANI KHANRA JHA**

Scope and Objective of the Course:

This course is an introduction to the field of Hydrology and Water Resources Engineering. The study covers basic fundamentals of water resources engineering such as hydrologic cycle, rainfall, runoff, reservoir planning, Introduction to dams, spillways, diversion headworks and distribution systems Flood routing, Systems Analysis techniques for planning, Ground Water hydrology, Water withdrawals and uses, River basin management. The unified approach will enable students to tackle the real life problems in more comprehensive manner and provide a broader view on the subject.

Text Book:

TB1. Reddy, Dr.P.Jaya Rami, A Textbook of Hydrology, University Science Press, New Delhi, Third Edition, 2011.
TB2. Modi, Dr. P.N., Irrigation Water Resources and Water Power Engineering, Standard Book House, Rajsons Publications Pvt. Ltd., Eighth Edition, 2012.

Reference Books:

RB1. Mays, Larry W, Water Resource Engineering, WSE, Wiley India, Second Edition, 2010.
RB2. Patra, K.C., Hydrology and Water Resources Engineering, Narosa Publishing House, New Delhi, Second Edition, 2008.
RB3. Subramanya, K., Engineering Hydrology, McGraw Hill Education (India) Private Limited, New Delhi, Fourth Edition, 2013.

Course Plan:

Lec. No.	Learning Objectives	Topics to be covered	Reference to Text Book (Chapter/section)
1- 3	Introduction	History of Hydrology, Water Resources Assessment, Water Resources Planning, Issues in Systems Approach, Hydrologic Cycle, Various applications of Hydrology, Irrigation	CH-1 (T1), CH-1 (T2), CH-2 (R1)
4-9	Precipitation, Losses	Types of precipitation, Measurement of Rainfall, Network Design, Analysis of Rainfall data, Depth area duration curves, Different forms of losses	CH- 5, 7, 8 (T1)
10-13	Methods of Irrigation, Water requirement of crops and estimation methods	Conventional methods for water requirement of crops, various ET estimation methods.	CH-7 (T1) CH-2, 4 (T2)
14-17	Ground Water Hydrology	Definitions, confined and unconfined aquifers, Well Hydraulics	CH-9 (T1), CH-6 (T2), CH-6 (R1)
18-23	Runoff and Hydrograph analysis	Types of catchment, Factors affecting runoff, Stage discharge relationships, Unit Hydrograph, Flood Hydrograph, S-Hydrograph, IUH hydrograph etc.	CH-4, 10, 11, 12 (T1) CH-5 (T2)
24-26	Flood Routing	Various aspects of Reservoir and Stream flow routing	CH-13 (T1), CH-9 (R1)
27- 30	Reservoir planning	Selection of site, mass curve, life of reservoir, cost aspects, benefit and cost ratio	CH-7 (T2) CH-10 (R2)
31-34	Probability and Statistics in Hydrology	Statistical parameters, Probability distribution, Frequency analysis, Regression and correlation	CH-3 (T1) CH-10 (R1)
35-38	Introduction to dams, Design of simple dams	Various types of dams, advantages of dams, simple designs	CH-8, 9 (T2)
39-41	Introduction of Water Resources Economics	Basics of economic concepts applicable and useful for various components of a water resource system	CH- 11, 19 (R1)
42	Water resource development planning	Brief idea about purposes served by water resource development projects, classifications, financial analysis, pitfalls in project planning	CH-22 (T2)

NOTE TO STUDENTS:
Students can follow the text and reference books cited in the handout to practice the problems.

Evaluation Scheme

No.	Evaluation component	Duration	Weightage (%)	Date & Time	Nature of component
1	Mid-Semester examination	90 min	30	16/3 9:00 - 10:30 AM	CB
2	Comprehensive examination	180 min	45	7/5 FN	CB+ OB
3	Tutorials/Quizes/Assignments	continuous	25	To be announced in class on a regular basis	

Chamber Consultation Hour: To be announced in the class on regular basis. IC chamber is 6021I.

Make-up Policy:

1. Make-up will be granted only on genuine reasons. However, prior permission of IC is must.
2. For medical cases, a certificate from the concerned physician of the Medical Centre must be produced.
3. Please also refer item no. 6 on page 2 of Part I of course handout mentioned in the Timetable for First Semester for more details.

Academic honesty and academic integrity Policy:

Academic honesty and academic integrity are to be maintained by all of the students throughout the Semester and no type of academic dishonesty is acceptable in any component of the course.

Notices: All notices concerning the course will be displayed either on Nalanda webpage or will be announced in class on regular basis.

Instructor-in-charge

CE F341