Lesson Plan - CE1020 – Hydraulic and Irrigation Structures Design
Academic year 2015-16
(Semester commencing in June 2015)

Instructional objectives number	Instructional objectives (IO)
1	To learn about the hydrologic cycle, precipitation and rain-gauge network design.
2	To study the seepage under structures through Bligh's theory, Lane's theory, and Khosla's theory; types of dams and the hydraulic design of dams.
3	To know about the types of reservoir and the methods to design reservoir capacity.
4	To understand the features of canal alignment and canal design capacity,
5	To study the features of canal regulator, canal fall, canal escape, aqueduct, super-passage, and canal siphon.

Student outcomes

Student outcome number	Student outcome (SO)
a	an ability to apply knowledge of mathematics, science, and engineering
b	an ability to design and conduct experiments, as well as to analyze and interpret data
c	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
e	an ability to identify, formulate, and solve engineering problems
h	the broad education necessary to understand the impact of engineering problems in a global, economic, environmental, and social context

Mapping of Instructional Objectives (IOs) with Student Outcomes (SOs)
CE1020 – Hydraulic and Irrigation Structures Design

Instructional objectives	Student Outcomes				
	a	**b**	**c**	**e**	**h**
1. To learn about the hydrologic cycle, precipitation and rain-gauge network design.	X	X	X	X	X
2. To study the seepage under structures through Bligh's theory, Lane's theory, and Khosla's theory; types of dams and the hydraulic design of dams.	X		X	X	X
3. To know about the types of reservoir and the methods to design reservoir capacity.	X		X	X	X
4. To understand the features of canal alignment and canal design capacity,	X		x	X	X
5. To study the features of canal regulator, canal fall, canal escape, aqueduct, super-passage, and canal siphon.	X				

CE1020	Hydraulic and Irrigation Structures Design	Lecture Hours (L)	Tutorial Hours (T)	Practical Hours (P)	Credits (C)
		3	0	0	3
	Prerequisites Nil				

Lesson Plan – 2015-16			**Revision: 0 dated 29/06/2015**		
Lecture No.	Topic	No. of hours	IOs	SO	Reference
1.	Introduction	1	1,2,3,4,5	a,b,c,e,h	1,2,3,4,5
	UNIT I – NETWORK DESIGN				
2.	Hydrologic cycle- Precipitation - Types	1	1	a	2,3
3.	Rain gauge - Types	1	1	a	2,3
4.	Average depth of precipitation - Estimation of missing precipitation records	1	1	a,b,c,e,h	2,3
5.	PMP – Rain-gauge network –Optimum rain gauge network design	2	1	a,b,c e,h	2,3
	Cycle Test –I				
	UNIT II – DIVERSION AND IMPOUNDING STRUCTURES				
6.	Theories of seepage – Bligh's creep theory	1	2	a	1,2
7.	Lane's weighted creep theory – Khosla's theory	1	2	a	1,2
8.	Design of apron	1	2	a,c,e	1,2,5
9.	Simple design problems on weirs and barrages	2	2	a,c,e	1,2,5

Lecture No.	Topic	No. of hours	IOs	SO	Reference
10.	Gravity dams, Earth dams	2	2	a	1,2
11.	Spillways – Factors affecting location and type of dams	1	2	a	1,2
12.	Forces on a dam – Hydraulic design of dams	2		a,c,h	1,2,5
	Cycle Test - II				
	UNIT III – RESERVOIR PLANNING AND MANAGEMENT				
13.	Reservoir - Types	1	3	a	1,2
14.	Storage capacity of reservoir - Storage zones	1	3	a,e	1,2
15.	Designing reservoir capacity	2	3	a,c,h	1,2,5
16.	Flow duration curves – Mass curves of Inflow and outflow	1	3	a,e	1,2
17.	Reservoir Losses	1	3	a	1,2
18.	Reservoir sedimentation - Silt control	1	3	a,e	1,2
19.	Design of flood-levees and flood walls	3	3	a	1,2,5
	UNIT IV – IRRIGATION CANALS				
20.	Irrigation – Advantages and disadvantages	1	4	a	1,4
21.	Alignment of canals	1	4	a,h	1,4
22.	Canal distribution system	2	4	a,h	1,4
23.	Design capacity of an irrigation canal	3	4	a,c,e,h	1,2,3
24.	Canal losses – Canal regulation	2	4	a	1,2,3
	UNIT V – CANAL REGULATION AND TRANSMISSION STRUCTURES				
25.	Canal regulators – Canal falls – Canal Escapes	4	5	a	2,4
26.	Metering flumes	1	5	a	2,4
27.	Cross- drainage works – Aqueduct – Syphon aqueduct – Super-passage – Canal siphon	4	5	a	2,4
28.	Types and Selection	1	5	a	2,4
	Model Examination				
	Total hours	45			

The faculty members handling the course may conduct surprise test according to their convenience. However a question paper in hard copy as well as key shall be made available for the surprise test. The process shall be same as that of cycle tests.

TEXT BOOKS

1. Modi .P.N, 'Irrigation, Water Resources and Water Power Engineering", Standard Book House, New Delhi, 2008.
2. Santosh Kumar Garg, "Irrigation Engineering and Hydraulic Structures", Khanna Publishers, Delhi, 2007.

REFERENCE BOOKS

3. Raghunath .H.M, "Hydrology", New Age International Publishers, New Delhi, 2007.
4. Asawa .G.L, "Irrigation and Water Resources Engineering", New Age International Publishers, New Delhi, 2005.
5. Sharma .R.K, "Irrigation Engineering and Hydraulic Structures", Oxford and IBH Publishing Company, New Delhi, 2002., 2010.

Course Coordinator

Dr.G.Baskar

Faculty handling the courses

Sl. No.	Faculty name
1	Dr.G.Baskar
2	Dr.R.Sathyanathan
3	Mr.Shaik Niyazuddin Guntakal
4	Mrs.N.A.Sreemanthra Rupini
5	Mr.S.Ramesh
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7	Ms.Golda Percy
8	Mr.G.Prem Kumar