Marwadi University

Syllabus for Master of Technology

Civil Engineering (Geotechnical)

Earth & Rock fill dams
0MGT206 (PEC)

Objective of the Course:

The main objectives of offering this course at ME sem-2 level are as following:

1. Critically review the principles and methods for construction of the earthen dams
2. Analyze stresses and seepage in the earthen dam
3. Selection of the earth material and its gradation for the various components of dam

Credits earned: 5

Students learning outcomes:

After successful completion of the course it is expected that student will be able to..

1. Analyze the given site for the construction of the earth dam
2. Analyze the local material and design the earth dam by using the same
3. Understand about the dam instrumentation for distress.
4. Understand the dam distresses and its remedial measures

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	CSE (M)	Internal (I)	Viva (V)	Term Work (TW)	
4	0	2	5	50	30	20	25	25	150

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Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	**Introduction**	**8**
	Dam and its classification	2
	Procedure of construction for earthen dam	2
	Site selection and common problems faced	2
	Case studies	2
2	**Earthen Dams**	**12**
	Concept of earthen dam, height of the dam	2
	Design of the hearting and casing for zoned dam	3
	Design of the various component parts of the dam: filter, cutoff wall, foundation, riprap, shear key etc	4
	Stability analysis & Codel requirements	3
3	**Rockfill dams**	**12**
	Rockfil dams types and height	1
	Rock material selection and techniques for its construction	3
	Design of the various component of the rock fill dams: zones, transition zone, riprap, filter etc	3
	Stability analysis and settlement	2
	Spill way, Gate operations and flood routing	3
4	**Health monitoring & Dam safety**	**12**
	Quality control of construction	2
	Instrumentation for ambient measurements and its location	3
	Common distresses and its remedies	3
	case studies.	3
	Dam safety	2

Suggested list of the experiments

1. Proctor compaction test
2. Sieve analysis and grading
3. Measurement of the piezometric head in model of the earth dam
4. Demonstration of the piping failure
5. Demonstration of the slope failure
6. Demonstration of filter design against chocking and washed out of particles

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	25%	20%	25%	15%	05%

Instructional Method and Pedagogy:

1. Use of Learning Management system like canvas
2. Demonstration through ppt and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

Recommended Study Material:

Reference Book:

1. Creager W. P. Engineering for dams, Wiley, 1967.
2. Singh, B. Earth and Rockfill dam, Sarita Prakashan, 1973.
3. Sowers G. I. Earth and Rockfill dam engineering, A. Earth Manual, USBR Publication.
4. Arcold - Volume on earth and rockfill dams.
5. Mistry J. F., Dams and Appurterant Works (Imp. Aspects of River valley projects), Mahajan Book Dist., 1998.
6. Sharma H. D., Embankment Dams, Oxford and IBH Pub., 1991.
7. Design of Small Dams, USDI, Oxford and IBH, 1976

Web Resources

1. http://nptel.ac.in/courses/105105110/pdf/m4l04.pdf
2. http://nptel.ac.in/courses/105105040/

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