

# Design & Construction of Earthen Dams

<b>Course Code</b> CE- 428	<b>Credit Hours</b> 3-0
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## Course Description

The course deals with the introduction of earthen dams including their design and aspects to be considered for successful construction.

## Text Book:

1. Design of Small Dams, (1987) United States Department of the interior, Bureau of Reclamation, A water Resource Technical Publication.
2. EM 1110-2-2300 (2004). General Design and Construction Considerations for Earth and Rock-Fill Dams.
3. Fell et al. (2005). Geotechnical engineering of dams. CRC press.
4. Kutzner, C. (2018). Earth and rockfill dams: Principles for design and construction. Routledge.

## Reference Book:

1. Duncan, J. M and Wright, S. G. (2005), Soil Strength and Slope Stability, John Wiley & Sons.
2. Abramson et al. (2001), Slope Stability and Stabilization Methods, John Wiley & Sons.
3. Landslides; Analysis and Control, Transportation Research Board Special Report 176 National Academy of Sciences.

## Prerequisites :

CE-222 SM-1 and CE-324 SM-II

## ASSESSMENT SYSTEM FOR THEORY

	<b>Without Project (%)</b>	<b>With Project/Complex Engineering Problems (%)</b>
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25

Project	-	5-10
End Semester Exam	50	45-50

### ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

### Teaching Plan

Week No	Topics/Learning Outcomes
1	General Design Criteria, Classification of dams, Requirements of good dam site. Comparison of rigid and earthen dams
2	Classification of earthen dams, Types of construction Earth dam foundations. Materials of construction Causes of failure, Criteria for safe design, Preliminary section
3	Theoretical Aspects of Seepage Fundamentals of seepage flow, A Casagrande's method
4	Flow net for earth dam, Use of computer software for generating flownet
5	Control of Seepage Through Embankments Adverse effects of seepage, Methods of seepage control
6	Provision of core, Design of transition filters Drainage of embankments Drainage of upstream face, Control of seepage on downstream face
7	Control of Seepage Through Foundations Foundation categories, Conventional categories, Slurry trench Concrete diaphragm walls, Alluvial grouting Upstream impervious blanket, Downstream loading berm
8	Relief wells. Treatment of liquefying sands
9	<b>Mid Semester Exam</b>
10-12	Slope Stability, Empty reservoir, Steady state seepage
13	Section Details and Special Problems Section details, Cracking and its control
14	Dams on fault zone, River diversion, Conduits through earth dams
15	Quality Control of Earthen Dams Dispersive and expansive soils Compaction, Placement control, Field tests Borrow area control
16	Foundation preparation and treatment, Contact treatment
17-18	End Semester Exam

**Practical:** Nil.