



GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

Subject Code 37243116

Semester – II

Subject Name: Earth & Rock-fill dams

Type of course: PE-IV

Prerequisite: Knowledge of Geotechnical Engineering and Fluid Mechanics

Rationale: The course on *Earth and Rock-fill Dams* provides the students basic knowledge on dam selection, analysis & design, stability checks, instrumentation and maintenance of dams for proper functioning and utility acquainted with latest field practices and codal guidelines.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Site investigation: Classification of dam w.r.t material, construction technique, purpose, etc; selection of basic dam section and factors affecting it, classification and selection of construction materials and construction technique. Special problems pertain to foundation treatment and related case studies.	08
2	Earthen dams Design of earth dam (small and large) as per general practice and codal guidelines, seepage analysis, flow nets, seepage control measures, stability analysis for various conditions, design of filters for slope protections, relief well and upstream blanket, quality control, failure of dams (Case studies)	12
3	Rock-fill dams Selection of materials, design details and modern construction techniques of rock-fill dam, special problems, settlement, core and transition zone, limitations of laboratory parameters evaluations, rock-fill and spillway operation, routing of floods, gate operation , Case studies.	12
4	Quality control measures Need of instrumentation, classification of instrumentation, location of in dam section, monitoring of dam, maintenance and dam safety measures, distress and remedial measures in earth and rock-fill dams, earth pressure problems at interface of earth fills and abutments.	10



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Reference Books:

1. Singh, B. Earth and Rockfill dam
2. Sowers G. I. Earth and Rockfill dam engineering, A. Earth Manual, USBR Publication.
3. Sharma H. D., Embankment Dams
4. Creager W. P. Engineering for dams

Course Outcomes: Students will be able to

Sr. No.	CO statement	Marks % weightage
CO-1	Select the most suitable site for the construction of the earth dam	10
CO-2	Analyse the various components of earth dams and rockfill dams as per codal guidelines and design this components	40
CO-3	Carryout slope stability analysis for various end conditions using appropriate methods including computational methods.	25
CO-4	Understand about the dam instrumentation for distress.	15
CO-5	Suggest Safety Measures and quality control methods.	10