

Irrigation Engineering And Hydraulic Structures Garg

Designed primarily as a textbook for the undergraduate students of civil and agricultural engineering, this comprehensive and well-written text covers irrigation system and hydroelectric power development in lucid language. The text is organized in two parts. Part I (Irrigation Engineering) deals with the methods of water distribution to crops, water requirement of crops, soil-water relationship, well irrigation and hydraulics of well, canal irrigation and different theories of irrigation canal design. Part II (Water Power Engineering) offers the procedures of harnessing the hydropotential of river valleys to produce electricity. It also discusses different types of dams, surge tanks, turbines, draft tubes, power houses and their components. The text emphasizes on the solutions of unsteady equations of surge tank and pipe carrying water to power house under water hammer situation. It also includes computer programs for the numerical solutions of hyperbolic partial differential equations. KEY FEATURES : Provides worked out examples and problems (in SI units). Presents all possible methods of design including Ranga-Raju-Misri's new approach of canal design. Gives numerous illustrations to reinforce the understanding of the subject. Besides undergraduate students, this book will also be of immense use to the postgraduate students of water resources engineering.

Hydraulic Structures demonstrates to the advanced undergraduate student the design of hydraulic structures in practice. It does this by explaining dam engineering, the design and construction of embankments, dam outlet works and pumping stations.

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Water is the essential element that all life-forms on our planet are dependent on. It is impossible to assess its value because it is equal to the life itself. Humans realized this fact long time ago and they always endeavored to control and manage water resources as they were afflicted by the drought and flood events throughout history. Therefore, the engineering of water resources and hydraulic structures is as old as the human civilization. The earliest known engineered irrigation system was developed in ancient Mesopotamia (Iraq); an advanced system of dikes, dams and canals was built for the purpose of irrigation and flood control. The main water sources for this system were the rivers Euphrates and Tigris. During plant growing seasons, the flow of water was properly regulated. Each farmer was allowed a certain amount of water, which was diverted from the canal into an irrigation ditch. The oldest known engineering plan of such an irrigation system has been documented on some unique and ancient clay tablet which has been discovered in Babylonia (belonging to 1684-1647 BC). It shows a map of canals with cuneiform scripts providing details about names, lengths, widths and depths of the canals and the volume of sediment to be dredged. Mesopotamians have acquired the expertise of maintaining their irrigation system over thousands of years. This contribution was a major step toward the modernization of humanity. The Water Research Center (located in Iraq), which is dedicated to the exchange of knowledge and technology in the water sector, has been inspired by those ancient engineers, hence published this book series entitled "Progress in River Engineering & Hydraulic Structures". It is intended to be a worldwide platform for the contemporary research in this field. Chapters of this series demonstrate the stringent need for new solutions and technologies in the subject of river engineering and hydraulic structures. The chapters cover a wide range of problems related to river regime and training works, performance of different kinds of hydraulic structures and any related multidisciplinary research. We believe that through the collaboration of researchers, engineers and professionals, we can accelerate the development in these areas. The book is aimed to serve as a reference for both researchers and postgraduate students.

The Book Irrigation And Water Resources Engineering Deals With The Fundamental And General Aspects Of Irrigation And Water Resources Engineering And Includes Recent Developments In Hydraulic Engineering Related To Irrigation And Water Resources Engineering. Significant Inclusions In The Book Are A Chapter On Management (Including Operation, Maintenance, And Evaluation) Of Canal Irrigation In India, Detailed Environmental Aspects For Water Resource Projects, A Note On Interlinking Of Rivers In India, And Design Problems Of Hydraulic Structures Such As Guide Bunds, Settling Basins Etc. The First Chapter Of The Book Introduces Irrigation And Deals With The Need, Development And Environmental Aspects Of Irrigation In India. The Second Chapter On Hydrology Deals With Different Aspects Of Surface Water Resource. Soil-Water Relationships Have Been Dealt With In Chapter 3. Aspects Related To Ground Water Resource Have Been Discussed In Chapter 4. Canal Irrigation And Its Management Aspects Form The Subject Matter Of Chapters 5 And 6. Behaviour Of Alluvial Channels And Design Of Stable Channels Have Been Included In Chapters 7 And 8, Respectively. Concepts Of Surface And Subsurface Flows, As Applicable To Hydraulic Structures, Have Been Introduced In Chapter 9. Different Types Of Canal Structures Have Been Discussed In Chapters 10, 11, And 13. Chapter 12 Has Been Devoted To Rivers And River Training Methods. After Introducing Planning Aspects Of Water Resource Projects In Chapter 14, Embankment Dams, Gravity Dams And Spillways Have Been Dealt With, Respectively, In Chapters 15, 16 And 17. The Students Would Find Solved Examples (Including Design Problems) In The Text, And Unsolved Exercises And The List Of References Given At The End Of Each Chapter Useful.

Transitions are provided in hydraulic structures for economy and efficiency. This book covers all types of flow transitions: sub-critical to sub-critical, sub-critical to super critical, super-critical to sub-critical with hydraulic jump, and super-critical to super-critical transitions. It begins with an introduction followed by characteristics of flow in different types of transitions and procedures for hydraulic design of transitions in different structures. Different types of appurtenances used to control flow separation and ensure uniform flow at exit of transition and diffusers are included. Examples of hydraulic design of a few typical hydraulic structures are given as well.

The Book Elementary Irrigation Engineering Has Been Written To Meet The Needs Of Diploma Students Of Civil Engineering For Their Course In Irrigation Engineering. It Deals With The Basics Of Major Topics Related To Irrigation Engineering. The First Chapter Introduces Irrigation, Its Development In India, And Different Irrigation Methods. Hydrological Aspects Of Irrigation Engineering Have Been Introduced In Chapter 2. Soil-Water-Plant Relationships And Water Requirement Of Crops Have Been Dealt With In Chapter 3. Well Irrigation Has Been Described In Chapter 4. Different Aspects Of Canal Irrigation Have Been Discussed In Chapters 5 And 6. Basic Features Of Planning And Design Of Major Canal Structures (Such As Canal Regulation And Cross-Drainage Structures, And Canal Head Works) Have Been Described In Chapters 7, 8, And 10. Chapter 9 Deals With River Training Methods, While Chapter 11 Deals With Basic Aspects Of Major Hydraulic Structures Such As Dams, Reservoirs, And Spillways.

This book discusses in detail the planning, design, construction and management of hydraulic structures, covering dams, spillways, tunnels, cut slopes, sluices, water intake and measuring works, ship locks

and lifts, as well as fish ways. Particular attention is paid to considerations concerning the environment, hydrology, geology and materials etc. in the planning and design of hydraulic projects. It also considers the type selection, profile configuration, stress/stability calibration and engineering countermeasures, flood releasing arrangements and scouring protection, operation and maintenance etc. for a variety of specific hydraulic structures. The book is primarily intended for engineers, undergraduate and graduate students in the field of civil and hydraulic engineering who are faced with the challenges of extending our understanding of hydraulic structures ranging from traditional to groundbreaking, as well as designing, constructing and managing safe, durable hydraulic structures that are economical and environmentally friendly.

Irrigation Engineering and Hydraulic Structures comprehensively deals with all aspects of Irrigation in India, soil moisture and different types of irrigation systems including but not limited to Sprinkler, Tubewell, Canal and Micro-Irrigation. The book also focuses on Engineering Hydrology, Dams, Water Power Engineering as well as Irrigation Water Management. Special care has been taken to highlight the principles, practices and design procedures that have been widely recommended as well as suggest improvements in the application of existing methods and adoption of latest techniques used in other parts of the world.

Market_Desc: For the undergraduate students of civil engineering at major Indian universities and engineering colleges. The text is also useful to the experts and professionals in the field of irrigation and agriculture. Special Features: · Presents neatly-drawn drawings of dams, spillways, canals and cross-drainage works, not provided with any other book. · Explains all aspects of soil moisture, irrigation systems, tanks, dams and canal river systems, water rights and environmental aspects. · Discusses live case studies of major dams (the Tehri Dam, the Almatti Dam) for easy understanding of some important concepts. · Explains all topics with solved examples and neatly-drawn sketches. · Uses the SI units throughout the book. · Supplies chapter-end problems and objective questions for self assessments. About The Book: Irrigation Engineering is designed for the undergraduate students of civil engineering at major Indian universities and engineering colleges. The text is also useful to the experts and professionals in the field of irrigation and agriculture. The content is divided into two parts: Part A and Part B. Part A contain 21 chapters. In this part, the author has discussed various irrigation systems usually adopted in different agro-climatic regions in India. With neatly-drawn sketches, the design of irrigation structures for storage, diversion, distribution and control are illustrated with exam-oriented worked-out examples. Part B of the book comprises 27 irrigation/hydraulic structures (called plates), presenting sketches with usual three-views to scale of dams, spillways, canals and cross-drainage works. These sketches are furnished with all details and dimensions (workable drawings) with lucid and complete designs.

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