Course No.	**CE 224001**
Course Title	**Channel Hydraulics**
Credits	**L T P Cr** **3 0 0 3**
Prerequisites	**-**

Course Contents:

Unit-1 Introduction: Open channel flow: Overview, Flow classifications, Types of channels, Pressure and velocity distribution in flow. One dimensional method of flow analysis, basic equations of fluid flows.

Unit-2 Uniform Flow: Introduction, Chezy's and Manning's equation, Darcy-Weisbach friction factor, Shear stress distribution, Equivalent roughness, Uniform flow computations, Standard lined channel, Hydraulically efficient channels, Compound sections.

Unit-3 Energy-Depth Relationships: Specific Energy, Normal and critical depth, Calculation of critical depth for rectangular, triangular and trapezoidal channels, Computations of specific energy, Transitions- obstruction and choking.

Unit-4 Gradually Varied Flow-Theory & Computations: Introduction, Differential equation of GVF, Classifications of flow profiles, Direct-step and standard-step method. Advance numerical methods (overview).

Unit-5 Rapidly Varied Flow-Hydraulic Jump: Introduction, Momentum equation for hydraulic jump in rectangular channel, Classification of jumps, characteristics of the jump, hydraulic jumps in non-rectangular channels, Jump as energy dissipator-stilling basins.

Unit-6 Unsteady Flows: Governing equations for gradually varied unsteady flows, Numerical methods to compute unsteady flows, Channel routing by Muskingum Method, Surge in channel: Positive and Negative, Dam break flow problem.

Reference / Text Books

1. Subramanya, K. *Flow in open channels.* Tata-McGraw-Hill Publishers.
2. Das, M. M. *Open Channel Flow.* PHI Publishers.
3. Srivastava, R. *Flow through open channels*. Oxford Press Publications.
4. Chaudhary, M. H. *Open-channel flow.* Springer Publications.

Any other Remarks: