

# Hydraulics - Video course

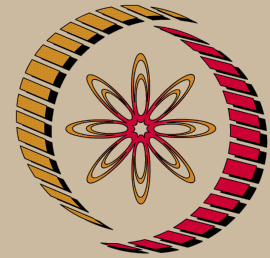
F

Topics	No. of Lectures
<b>Introduction to Open Channel Flow:</b> Difference between Open Channel Flow and Pipe Flow, Types of Channel, Geometric parameters of a channel, Classification of Open Channel Flow, Continuity and Momentum equation.	3
<b>Uniform flow:</b> Resistance flow formula, Velocity distribution, Equivalent roughness coefficient, Velocity coefficients, Uniform flow in rigid boundary channel, Uniform flow in mobile boundary channel	7
<b>Energy and Momentum Principle:</b> Concept of Specific Energy, Critical Depth, Alternate depth, Specific Force, Sequent depth.	4
<b>Non-Uniform Flow:</b> Governing equation of GVF, Classification of Gradually Varied Flow, Computation of GVF profile, Rapidly Varied Flow, hydraulic Jump, Flow over a Hump, Flow in Channel Transition.	8
<b>Canal Design:</b> Concept of best hydraulic section, Design of rigid boundary canal, design of channel in alluvial formation- Kennedy's theory, Lacy's theory, Method of Tractive force, Free-board in canal.	5
<b>Unsteady Flow:</b> Wave and their classification, Celerity of wave, Surges, Characteristic equation.	3
<b>Pipe Flow:</b> Losses in pipes, Pipe in series and parallel, Pipe network analysis, Water hammer, Surge tank.	7
<b>Hydraulic Model Study:</b> Important dimensionless flow parameters, Similitude: Geometric, Kinematic and Dynamic Similarity, Model scales	3
<b>Total Lectures</b>	<b>40</b>

**Lab:**

Experiment on the following

1. Determination of Manning's "n"
2. Specific energy curve
3. Gradually Varied Flow Profile



NP-TEL

# NPTEL

<http://nptel.ac.in>

## Civil Engineering

**Coordinators:**

**Prof. Arup Kumar Sharma**  
Department of Civil Engineering IIT  
Guwahati

4. Hydraulic Jump
5. Flow over Hump
6. Flow through Channel Contraction
7. Pipe friction
8. Water hammer