

CE 515: River Engineering(3-0-0:3)

Overview of river engineering

River classifications, Thresholds in river morphology, Hydraulic geometry, Meander plan form.

Hydraulics of river flow

Fundamentals of alluvial channel flows, Uniform, non-uniform, steady and unsteady cases, Shear stress distribution, Flow resistance in rivers.

Sediment transport and scouring

Physical properties of sediments, Sediment movement in rivers, shear stress, Shields diagram, Scouring around bridge piers and embankments, River bed forms, Design of stable alluvial channels, Regime concept, Braided rivers, Alternate bars, Bed load transport in braided gravel-bed rivers.

River training and stabilization

Stream bank erosion, Bank protection, Flow control structures, Bank protection and river training along braided rivers, river training for navigation

River flow augmentation

Dam engineering and related environmental issues,

Text Books and References:

1. Chang, H. H., "*Fluvial Processes in River Engineering*", John Wiley.
 2. Gregory, H., "*Braided Rivers: Process, Deposits, Ecology and Management*", Blackwell Publishing.
 3. Knighton, D., "*Fluvial Forms and Processes*", Edward Arnold.
 4. Richards, K., "*Rivers Form and Process in Alluvial Channels*", Methuen.
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