CE 511: Computational Methods In Water Resources Engineering (3-0-0-3)

Course objectives: To give an overview of computational techniques of interest with emphasis on the techniques and to equip the students with capabilities to model and solve water resources problems.

Introduction
Review of numerical methods and solution techniques.

Modeling water resources system
Modeling concepts and overview of computer models for; Surface water systems, Subsurface water system; Irrigation engineering and management, Coastal engineering.

Computing techniques
Numerical methods, Finite difference and finite element methods, Applications in surface and ground water modeling, Solute transport problems, Pipe network analysis.

Artificial intelligence
Applications in water resources engineering.

Text Books and References:
1. Niyogi, P., Chakrabarty, S. K., Laha, M. K., "*Introduction to Computational Fluid Dynamics",* Pearson Education.
2. Reddy, J. N., "*An Introduction to Finite Element Method",* Tata McGraw-Hill.
3. Chow, V.T, Maidment, D.R., Mays.L.W., "*Applied Hydrology",* McGraw Hill.

Expected Outcomes: The students will be capable of modelling surface water, ground water flow problems applying finite difference and finite element technique and solve it applying numerical methods

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