CE 504: Sub Surface Hydrology (3-0-0-3)

Course objectives: To develop and enhance modelling skills for solving various ground water related real life problems with special emphasis on solute transport. Students' completing the course shall be capable of solving sub surface problems using mathematical models and numerical tools

---

Introduction
Groundwater Resources, Overview of groundwater systems

Groundwater modelling
Groundwater flow equations, Transport equations. Boundary and initial conditions, partially saturated flow systems. Finite difference methods applied to steady and transient groundwater systems.

Finite element method
Introduction to Finite Element Methods in groundwater problems.

Optimization technique
Introduction to optimization methods for Groundwater Management.

Text Books and References:

1. Bear, J., "*Dynamics of Fluids in porous Media",* Dover Publications.
2. Fetter, C.W., "*Contaminant Hydrogeology",* Prentice Hall.
3. Bear, J. and Verruijt, A., "*Modeling Groundwater Flow and Pollution",* Reidel Publishing Company.
4. Fetter, C.W., "*Applied Geohydrology",* Prentice Hall.

Expected outcome: The students shall be able to formulate sub surface hydrological processes in mathematical terms; be able to employ mathematical and computational techniques to solve real life sub surface flow problems.
