

Fall 2018

# CHE 702 - Modeling Contaminant Transport

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## **Modeling Contaminant Transport**

**CHE 702**

**3 units, Fall 2018**

**Instructor: Dr. Andrew JB Cohen**

### **Overview**

This course focuses on the description, analysis, and prediction of the transport and fate of contaminants in groundwater, soil, and sediment. The course is well suited for students pursuing careers in the environmental remediation and consulting sectors. Principles of contaminant transport and associated mathematical and numerical models will be combined with problem sets that are based on field data and case studies. Integration of field and laboratory data, together with qualitative descriptions and quantification/modeling of contaminant transport form a basis for developing Conceptual Site Models (CSMs) and remedial strategy.

### **Topics**

- Overview of contaminant transport processes and models
- Fluid mechanics review and flow in porous media
- Contaminant dissolution, advection, dispersion, degradation, and partitioning
- Mathematical models of solute transport
- Non-Aqueous Phase Liquids (e.g., petroleum hydrocarbons and solvents)
- Analytical and computer modeling for data analysis and prediction (inverse and forward modeling)
- Methodology of data collection, analysis, and scientific illustration

### **Grading**

Midterm	30%
Homework	30%
Final Exam	30%
Class Participation	10%

### **Homework**

Homework will be assigned regularly. It will be handed out in class and is due the following week.

### **Textbook and Exams**

Links to free textbooks and publications will be provided. The midterm and final are closed-book exams.

### **Academic Integrity**

The NJIT University Code on Academic Integrity will be upheld, and any violations will be brought to the immediate attention of the Dean of Students.