

## SOIL 655: Contaminant Transport Modeling (CTM)

**Aim:** To provide a clear coverage of the basic principles of water/vapor and nutrient/contaminant transport modeling, the theory behind transport, and step-by-step guidance on the use of some spreadsheet based and physically based models.

- Use of models on contaminant transport
- Modeling spatial variability of contaminants
- Modeling liquid water and water vapor transport
- DeVries and Philip classical papers on simultaneous movement of moisture and heat through porous media
- Factors controlling the transport and fate of solutes in vadose zone, advective- dispersive transport and chemical reaction under equilibrium and nonequilibrium conditions
- Theory of development of mathematical models of contaminant and nutrient transport
- Step-by-step application of contaminant transport models- emphasizing problem formulation, model setup, parameter selection, input output files, structure of files, calibration and sensitivity analysis

**Alternately:** A student develops a proposal on modeling contaminant transport through soil or air. He along with the instructor formulates objectives, methods and materials, and sets up deadlines for different tasks. These tasks must be completed by the agreed upon deadlines and must be submitted on or before the deadline. A deadline can be moved forward with the consent of the instructor.

**Course Overview:** This course presents case histories illustrating how hydrologists, geologists, chemists, civil engineers, soil physicist and environmental engineers apply transport models in real-life situations. Driven by growing concern over soil and groundwater quality and the rapid dissemination of computer technology, transport simulation has become an essential means of evaluating and solving vadose zone and groundwater contamination and remediation problems. This course contaminant transport modeling (theoretical and practical considerations), provides student with the tools to master it.

**CODE OF CONDUCT:** Please see the Student Code of Conduct in The Student Handbook: ([http://www.nmsu.edu/Campus\\_Life/vpsa/public\\_html/SCOC/index.html](http://www.nmsu.edu/Campus_Life/vpsa/public_html/SCOC/index.html)) Pay particular attention to III. B. Academic Misconduct. Academic misconduct will not be tolerated and will result in severe penalties including an F in the class.

**DISABILITIES:** If you have or think you may have a disability that interferes with your performance as a student in this class, you are encouraged for academic reasons to discuss this on a confidential basis with Services for Students with Disabilities at 646-6840 in Garcia Annex 102 or go to <http://www.nmsu.edu/~ssd/>. **If you have a disability, you must make this known to me so that arrangements can be made.** If you have a condition that may affect your ability to exit from the premises in case of emergency, you are urged, for safety reasons, to notify me.

**STUDENTS WITH DISABILITIES:** If you have (or believe you have) a disability and would benefit from classroom accommodation(s), please contact the Services for Students with

Disabilities (SSD) Office located at Corbett Center, Room 244 [Phone: 646-6840: TTY: 646-1918]

**Student Responsibilities:** Register with SSD and obtain accommodation documents early in the semester; Deliver the completed accommodation and testing form(s) to the instructor(s) within the first two weeks of beginning of classes (or within one week of the date services are to commence); Retrieve the signed form(s) from faculty and return to SSD within (5) days of the receipt from faculty and at least one week before any scheduled exam; and, Contact the SSD Office if the services/accommodations requested are not being provided, not meeting your needs, or if additional accommodations are needed. Do not wait until you receive a failing grade. Retroactive accommodations cannot be considered.

**OTHER HELP:** The Center for Learning Assistance is a valuable resource center for help in note taking, test taking, time-management and other useful academic skills. The website is very informative ([www.nmsu.edu/~cla/ssresources/](http://www.nmsu.edu/~cla/ssresources/)) or you can visit in person (Hardman Hall Room 210).

**GRADE DISPUTES:** If you feel that graded material (exam, assignment, lab) has been incorrectly marked or calculated, please bring it to my attention immediately. After you receive your graded material (exam, assignment, lab), **you have one week to discuss the problem with me.** I will not go back weeks after material is returned and change the grade.

**GRADE POSTING:** Grades for exams, quizzes, assignments, and your final grade will be posted on WEB-CT. I will not post your grades in a public location. Other students will not be able to see your grades unless you give somebody your logon and password identification.

- Note:** (1) Students must meet deadlines and turn in progress on or before the due date according to an agreed schedule.  
(2) Final grading is based on the cumulative grade for the entire class.