

ERSC 407H/WI: The fate of contaminants in the aquatic environment

syllabus 2008-2009

time Tuesday, 13:00 - 14:50

place GC 111

course coordinator and instructor

	email	office	phone
Dirk Wallschläger (DW)	DWallsch@TrentU.ca	CSB F 114	7378

office hours THU 15:00 - 17:00 and FRI 9:00 – 11:00

lecture schedule

date topic

1/6 aqueous phase speciation of inorganic contaminants

1/13

1/20 liquid-solid distribution of inorganic contaminants

1/27 chemical and biological transformations of organic contaminants

2/3 introduction to fugacity-based models

2/10 advanced fugacity-based models

2/17 **reading week**

2/24

3/3 kinetics of biogeochemical reactions

3/10 bioaccumulation of inorganic contaminants

3/17 biomagnification of organic contaminants

3/24 hydrological modeling

3/31 nutrient cycling and watershed budgets

Access to Instruction: *It is Trent University's intent to create an inclusive learning environment. If a student has a disability and/or health consideration and feels that he/she may need accommodations to succeed in this course, the student should contact the Disability Services Office (BL Suite 109, 748-1281, disabilityservices@trentu.ca) as soon as possible.*

course format

The course consists of ten lectures, three assignments and a modeling project. Each assignment connects logically to a block of lectures, and is handed out after this block. It is due two weeks after it's handed out (see schedule below). Late penalties for assignments handed in after the deadline are 5 % per calendar day; assignments handed in more than 10 days late will not be marked (= 0 %). To complete the assignments, you need access to a computer with Internet access and standard software (e.g. MS Excel). These assignments are individual tasks, and Trent's policy on plagiarism applies:

Academic dishonesty:

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offense and carries penalties varying from failure in an assignment to suspension from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's Academic Dishonesty Policy which is printed in the University Calendar and on the university web site at: http://www.trentu.ca/deansoffice/policies_dishonesty.php.

There are no additional components of the course that require your presence at Trent (labs, tutorial etc.), but half of the course mark will be awarded for a big modeling project that each of you is expected to complete. This work will be done in groups of 2 or 3 students (depending on course registration and complexity of problem). You will use an existing model to simulate an environmental problem and evaluate the results you obtain. For this, you will first download or install and then learn the model. Next, you will pick a scenario to which you want to apply it, select input data, run the model simulation, and finally discuss your results, particularly in comparison to existing measured data.

The course concludes officially with a half-day symposium in which each group will present their model and its capabilities, their modeling exercise and the results they obtained. I anticipate that each student will get to speak for about 30 min, so based on current registration numbers, we should be done in about 2 hours. The symposium will be held (location TBA) before the Spring exam period on a day agreeable to all students and the instructor (possibly MON 4/6); this date will be decided when the Spring exam schedule is released. Attendance is mandatory. While the majority of the mark for this presentation will be given for the content of the modeling exercise (i.e. each member of the group will receive the same mark), the style of each individual presentation will also be a minor factor in the final mark (i.e. there will be an individual component). Presentations will be done electronically; the course coordinator will supply a laptop and a data projector. Additionally, you are expected to submit a written summary of the project ("final report"), in which you will document the major steps of your project (details will be discussed in class).

While the final result of this project is not due until the symposium, you should distribute the work evenly over the whole term, so that you don't get into a crunch towards the end of the term and before the exam period. This, however, requires your own personal discipline. In the table below, I have listed some milestones along the project plan, as well as dates by which you're expected to complete each project step. The instructor will be available to provide feedback on your projects throughout the term. You will be required to hand in short formal documentations of your progress by the indicated dates, so you are expected to meet with me on or before that date to keep me updated of your progress and any problems you may encounter. **If no progress report is provided by the deadline for each milestone, the marks for this milestone will be lost**, and you will have to make up for the lost time.

The modeling programs you will use should either be present at Trent or available for free; they should also run on a modern computer. You are welcome to search for and select any program for this project, as long as it meets those requirements. Especially, check the website of the Canadian Environmental Modeling Centre here at Trent. Each model can only be used by one group. The choice of your model also determines the scenario you'll work on later to some extent, so you should get approval from the instructor on the selected model and at least a vague problem idea before you get started.

grade

one modeling project: 55 %

three assignments: 15 % each

assignments

topic	handed out	due date	mark
a) specific assignments			
inorganic speciation	1/20	2/3	15 %
organic contaminants	2/10	2/24	15 %
bioaccumulation	3/17	3/31	15 %
b) modeling project		4/6 (?)	55 %
milestones			
problem identified		1/20	2.5 %
model installed and tested		2/10	2.5 %
input data selected		3/3	2.5 %
output data evaluated		3/24	2.5 %
project presentation		4/6 (?)	30 %
final report		4/6 (?)	15 %