

**University of Manitoba  
Faculty of Environment, Earth and Resources  
Department of Environment and Geography**

**ENVR 4180 Ecotoxicological-Risk Characterization (3 credit hours) A01  
GEOG 7010 Ecotoxicological-Risk Characterization (3 credit hours) T01  
Term 2, 2018-2019**

**Instructor:** Mark Hanson, Ph.D.  
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**Office Hours:** By appointment

**Course Times:**

Room 315 Wallace on Tues. and Thurs. 10am-11:15am

**Prerequisites:**

Introductory Toxicology: ENVR 2180, Biology 2180 or Agriculture 2180.

**Course Materials:**

***Required***

Course notes mandatory, available from instructor for a nominal fee. Other required readings and notes will be distributed in class or via UM Learn.

***Recommended***

Suter II, G.W. 2006. Ecological Risk Assessment. Lewis Publishers, Boca Raton.

**Outline:**

A biologically based, advanced course that will give students working knowledge of current processes and techniques for ecotoxicological risk characterization. The course material will cover the topics of problem definition, dose response characterization, exposure characterization, risk assessment, and risk management decision-making. The course will be taught in biweekly lectures.

**Objectives:**

The student will be expected to be able to:

- Define problems in ecotoxicology.
- Understand how to and be able to characterize effects.
- Understand how to and be able to characterize exposure.
- Understand how to and be able to undertake a risk assessment.
- Understand the process of risk management decision-making.
- Apply these principles to a real-life hands-on problem chosen by the student.

**Subject materials to be presented:**

- Survey the need for and current uses of ecotoxicological-risk assessment.
- Examine and critically assess methods for defining problems in ecotoxicology.
- Review the advantages and disadvantages of methods for measuring dose-response in laboratory and field settings.
- Examine and critically assess the techniques for measuring and predicting exposure.
- Review the techniques for risk assessment and assess the advantages and disadvantages of these.
- Examine approaches and techniques for the management of risks.
- Study several case histories of ecotoxicological-risk characterization and critically assess these in relation to the above.

**Grading Scheme:**

Assignments	15% (Three assignments worth 5% each)
Term Paper	20%
Term Paper Presentation	5%
Midterm Exam	25%
Final Exam	35%
<b>Total</b>	<b>100%</b>

**Comments:**

**Policy regarding late assignments:** Every student is required to submit all of the assignments. Failure to submit an assignment will result in a mark of zero on that assignment; assignments submitted late will not be accepted without special permission.

**Midterm Test:** Failure to write the scheduled midterm examination without a valid medical or compassionate reason (e.g., death of an immediate family member) will normally result in a mark of zero on that examination. The course instructor reserves the right to reschedule a deferred test for those students who have a valid reason for not writing. Make-up tests will not necessarily follow the same format as the original exam.

**Final Examination:** All students must write the 3 hour final examination. Failure to write the final examination without a valid medical or compassionate reason (e.g., death of an immediate family member) will result in a mark of zero on the final examination. Deferral of a final examination can only be given by the student's home faculty – the instructor cannot reschedule a final examination.

**Evaluative Feedback:** Will be provided in the form of the midterm exam and two assignments prior to the voluntary withdrawal deadline date for this course.

**Final Grade:** A total mark of less than 50% in the course will result in a grade of **F**. Marks between 50% and 100% will be graded from **D** to **A+** according to the Department of Environment and Geography grading scheme below:

<b>Letter Grade</b>	<b>Percentage</b>
A+	90-100
A	80-89
B+	75-79
B	70-74
C+	65-69
C	60-64
D	50-59
F	<49.9

**Computer Lab:** All students will need to use the statistical software SigmaPlot and other programs to complete their assignments and term paper. The programs are available in the computer lab in 321 Wallace and you will be given a password to access the machines when they are not scheduled for regular teaching.

**Academic Conduct:** Students should acquaint themselves with the University's policy on plagiarism and cheating and examination impersonation (see University of Manitoba General Calendar). The copying of another student's assignment (or an instructor's answer sheet from a previous year) or the submission of the same material for two or more courses is plagiarism. Plagiarism and other forms of cheating are prohibited. The full definition of plagiarism and the possible penalties associated with it are outlined in the General Calendar. If your submitted assignment contains material you have copied from another source (e.g., from a textbook, web page, or from the published literature) you must give proper credit to that source.

**Schedule and order of material to be covered:**

<b>Date</b>	<b>Lecture Material</b>	<b>Assignments/Paper</b>
Jan. 8 <sup>th</sup>	Introduction/Basic Concepts	
Jan. 10 <sup>th</sup>	The Hazard Quotient Approach	
Jan. 15 <sup>th</sup>	Frameworks for Risk Characterization	
Jan. 17 <sup>th</sup>	Creating a Conceptual Model	
Jan. 22 <sup>nd</sup>	Definition of the Problem in the Field	
Jan. 24 <sup>th</sup>	Characterizing the Dose-Response	
<b>Jan. 29<sup>th</sup></b>	Toxicity Test Methods	Assignment 1 Due
<b>Jan. 31<sup>st</sup></b>	Effects at the Ecosystem Level	Term Paper Topic
Feb. 5 <sup>th</sup>	Probabilistic Approaches to ERA	
Feb. 7 <sup>th</sup>	Characterizing Exposure	
Feb. 12 <sup>th</sup>	Weight of Evidence	
Feb. 14 <sup>th</sup>	Causality I	
<i>Feb. 19<sup>th</sup></i>	<i>Reading Week</i>	
<i>Feb. 21<sup>st</sup></i>	<i>Reading Week</i>	
<b>Feb. 26<sup>th</sup></b>	<b>Midterm Exam</b>	
<b>Feb. 28<sup>th</sup></b>	Causality II	Assignment 2 Due
<b>March 5<sup>th</sup></b>	Routes of Exposure	Paper Intro Due
March 7 <sup>th</sup>	Biomarkers and ERA	
March 12 <sup>th</sup>	Ranking Systems	
March 14 <sup>th</sup>	Dealing with Uncertainty in ERA	
March 19 <sup>th</sup>	Common Errors and Logical Fallacies	
<b>March 21<sup>st</sup></b>	ERA and Endangered Species	Assignment 3 Due
March 26 <sup>th</sup>	ERA and Mixtures	
March 28 <sup>th</sup>	Risk Management and Mitigation	
April 2 <sup>nd</sup>	Risk Communication	
<b>April 4<sup>th</sup></b>	<i>Presentations</i>	
<b>April 9<sup>th</sup></b>	<i>Presentations - Review</i>	Term Paper Due

**April 11<sup>th</sup>-April 26<sup>th</sup> Final exam will be held and is set by Students' Records Office**

*The voluntary withdrawal deadline date for this course is March 20th 2019.*