

**ENVR 1000 (A01 and A02) 3 Cr.Hrs.  
Environmental Science 1: Concepts  
Fall 2015**

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**INSTRUCTOR: LESLIE GOODMAN**

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Office Hours: Monday, Wednesdays 10:30 to 11:30 or by email arrangements (preferred)

**COURSE DESCRIPTION:**

This course explores the environment through the conceptual framework of its physical, chemical, and biological components. Students are introduced to the principles of ecosystem structure and function and the natural ecological services that purify, moderate and generate resources we rely heavily on to sustain life and human well-being. Students consider the natural and human-induced responses to disturbances found in, for example, aquatic systems such as wetlands and lakes; terrestrial systems involving soils and minerals, grasslands and forests; and the atmosphere, with consideration of the interactions and impacts to biotic processes. Strategies that promote sustainable management of natural resources are described through case study of parks and protected areas, endangered species management, water pollution abatement and alternative energy sources.

*Note that this course is also available as a distance education offering (ENVR 1000 D01).*

**COURSE MATERIALS:**

**Textbook:**

Berg, Hagar, Goodman, Baydack. 2010. Visualizing the Environment: Canadian Ed. John Wiley & Sons. Available electronically or hardcopy

**UM LEARN Website:** [www.umanitoba.ca/d2l](http://www.umanitoba.ca/d2l)

A virtual classroom is available online through UM Learn. You need to access this site and become familiar with the resources it offers **as soon as possible** as this is where you will find all supporting information related to the lectures.

Important resources are available on the UM Learn site and organized in various tabs that include:

**Course Home** – announcements will be made periodically regarding milestones, tests, videos etc. Watch for announcements frequently.

**Resources** – access to lecture summaries, unit objectives, and additional reading resources (such as links to documentaries and movies available on the Internet).

**Communication** – send the Instructor an email. ***NOTE that the university will only use your U of M email account for official communications.***

**Assessments** – grades are available on-line through the course homepage.

**SEE THE INSTRUCTOR SHOULD YOU HAVE ANY DIFFICULTIES WITH ACCESS TO INFORMATION.**

**EVALUATION CRITERIA: Tuesday/Thursday is A01; Monday/Wednesday/Friday is A02**

Test 1 – October 7 <sup>th</sup> (A02); October 8 <sup>th</sup> (A01)	25%
Test 2 – November 9 <sup>th</sup> (A02); November 10 <sup>th</sup> (A01)	35%
Final Examination – TBA (Scheduled by the Registrar)	40%
<b>Total</b>	<b>100%</b>

**Grading Scale:** Letter grades will be assigned at the completion of the course, as follows:

A+	Greater than 90%	C+	65-69%
A	80-89%	C	60-64%
B+	75-79%	D	50 -59%
B	70-74%	F	Less than 50%

**DEPARTMENT POLICIES:**

**Final Examination:** All students must write the final examination to receive a passing grade in the course. Failure to write the final examination without a valid medical certificate or compassionate reason (e.g. death of an immediate family member) will result in a mark of zero on the final examination and a grade of F(NP) in the course. ***Note that deferral of a final examination can only be granted by your home faculty student advisor.***

**COURSE ATTENDANCE AND ACADEMIC DISHONESTY:** Requirements for course attendance and rules regarding academic dishonesty are found in the General Academic Regulations and Policy Section of the University of Manitoba *Undergraduate Calendar*.

The following provide a few examples of academic dishonesty that students in this course should be aware of:

- copying from another student during quizzes, tests and examinations;
- copying instructor answer sheets from a previous year;
- copying text from the Internet or other sources without appropriate referencing.

**Important Dates:**

Thanksgiving Day: October 12<sup>th</sup> (no classes)

Remembrance Day: November 11<sup>th</sup> (no classes)

Voluntary Withdrawal Date: November 18<sup>th</sup>

Final Examinations Scheduled between December 11<sup>th</sup> – 23<sup>rd</sup> (Specific Date TBA)

**LECTURE TOPICS – refer to the Moodle site for an estimate of when we will be discussing each of the following units:**

**UNIT 1: Environment and Human Impacts (Chapter 1 pages 3-20; 26-30; Chapter 2 pages 53-59)**

- 1.1 Definitions of Environment and Environmental Sciences
- 1.2 Nonrenewable and Renewable Types of Resources
- 1.3 Human Demands on Resources Driven By Over-Population and Over-Consumption
- 1.4 Long-Term Projections of Resource Availability – Using the Ecological Footprint Calculator
- 1.5 Resource Management through the Principle of Sustainable Development
- 1.6 The Scientific Method Uncovers How the Environment Works

**UNIT 2.0: Ecosystem Dynamics (Chapters 5 pages 126-140; 142-154; Chapter 7 pages 202-207; Chapter 3 pages 66 – 73; Chapter 6 pages 164-167; 178-180; 183-188; 192-197)**

- 2.1 The Ecosystem Concept
- 2.2 Systems and Feedback

- 2.3 Thermodynamics, Energy Flow and Food Chains/Webs
- 2.4 Movement of Carbon, Nitrogen and Phosphorus in the Environment
- 2.5 Ecological Niche, Biological Diversity, Community Interactions, and Keystone Species
- 2.6 In-Class Video – **Wolves of Yellowstone National Park**
- 2.7 Exponential and Logistic Population Growth
- 2.8 In-Class Video – **Snow Geese in Peril**
- 2.9 Community Succession and Disturbance
- 2.10 Optional Internet Video – **Ashes to Forest**
- 2.11 (Canada's) Major Terrestrial Biomes and Aquatic Zones (assigned readings)

**UNIT 3.0: Toxins and Environmental Health (Chapter 2 Rachel Carson page 40; Chapter 4 pages 100-121)**

- 3.1 Types, Movement and Fate of Toxic Chemicals in the Environment
- 3.2 Dose Response Studies and Measuring Safe Levels of Toxins
- 3.3 Case Studies: DDT and Mercury Toxicity
- 3.3 Risk Assessment

**UNIT 4.0: Managing Ecosystems for Sustainability (Parts of Chapters 1, 2, 5, 7, 8, 13)**

- 4.1 Review of the Concept of Sustainable Development and Leopold's Land Ethic (pages 13-20; 36-42)
- 4.2 Jurisdictional Authority Over the Environment (pages 43-46)
- 4.3 The Ecosystem Approach to Environmental Management (pages 155-161)
- 4.4 Parks And Protected Areas Management (pages 267-271)
- 4.5 Sustainable Forest Management (pages 248-257)
- 4.6 In-Class Video – **Great Bear Rainforest**
- 4.7 Managing Biodiversity, Species At Risk, and Invasive Species (pages 200-227)
- 4.8 In-Class Video - **Shadows of the Forest**
- 4.9 Agroecosystems – Challenges and Best Management Practices (pages 236-247)

**UNIT 5.0: Aquatic Resources and Management (Chapter 9)**

- 5.1 Properties and Movement of Water (pages 288-293)
- 5.2 Water Pollution Challenges and Management (pages 294-309; 313-320)
- 5.3 In-Class Video – **Save My Lake**
- 5.4 Surface Water Runoff and Urban Storm Water Management (317-319)
- 5.6 Water Consumption and Management – Alternatives to Surface and Groundwater Withdrawals
- 5.7 In-Class Video – **California Dry**

**UNIT 6.0: The Atmospheric Environment (Chapter 10)**

- 6.1 Features of the Atmosphere (pages 340-348)
- 6.2 Greenhouse Gasses and Global Climate Change (pages 368-382)
- 6.3 Case Study - Arctic Sea Ice Dynamics and Implications
- 6.4 Measuring Air Quality and Assessing Air Pollution – Smog and Acid Rain (pages 348-366)
- 6.5 Stratospheric Ozone Dynamics (*if time permits; pages 383-387*)