EVR 1001 Introduction to Environmental Science and Sustainability
Spring Session 2016-Biscayne Bay Campus

Tuesday & Thursday 11:00 – 12:15 pm (Sect. B51; Glenn Hubert Library 160)
Dr. Gary M. Rand
randg@fiu.edu
Office hours: By Appointment --Building EL 1
Tel: (305) 919-5869

Required Text: Environmental Science, G. T. Miller, Jr. and S.E. Spoolman, 14th edition

Course Description:
Concerns about environmental degradation and its impact on human well-being are increasingly the topic of discussion and debate. The issues are global in scope and complex in nature, involving the functioning of both Earth’s natural systems and human societies. It is critical that we understand the function and importance of the natural services provided by planet Earth so that we can find ways to address the looming problems of climate change, pollution, desertification, declining water resources and loss of biodiversity. Environmental science is a necessary foundation for that understanding. This course will emphasize the scientific knowledge of the environment in a global context that will be needed for local, global, international and intercultural environmental problem solving in the coming decades.

Course Designation:
This course is a Global Foundations Course. It also satisfies the requirement for the University Core Curriculum Natural Sciences category – Physical Sciences sub-category when taken with the lab course, EVR 1001L.

Essential Questions
* What is scientific knowledge and how does it differ from other kinds of knowledge about the environment?
* How does science explain the functioning of Earth’s natural systems and how do different human societies interact with and depend on those systems?
* How do human societies need to change their interrelationship with Earth’s natural systems to halt environmental degradation and use natural resources and services sustainably?

Global Learning Outcomes and Assessments
Students will be assessed for the following Global Learning Outcomes with specific course outcomes listed below.
* Global Awareness – Students will be able to demonstrate an understanding of the scientific information and key concepts that underlie the functioning of natural systems with an emphasis on the interrelatedness of these systems with each other and human societies, as well as the negative impacts of environmental degradation on both.
An understanding of the scientific foundation and key concepts that describe the patterns and processes of Earth’s natural systems.

Awareness of the interrelationship of human activities and natural systems.

Ability to use scientific knowledge together with prior knowledge to engage in critical thinking about environmental issues arising from the interrelationship between human societies and natural systems.

Assessments for Global Awareness will include active learning activities and in-class exams.

* Global Perspective – Students will be able to examine environmental issues within a transdisciplinary and multi-perspective framework that supports creative ideas to promote environmental sustainability.
  --- Comprehension of the many interrelated technical, social and cultural contributions responsible for the complexity of environmental issues.
  --- The ability to examine environmental issues from the perspectives of multiple stakeholders.
  --- Develop an understanding of how environmental degradation may impact both natural systems and human societies in the future.

Assessment for Global Perspective will take the form of class discussion/debate on environmental topics where students discuss/analyze problems/situations from perspectives of different stakeholders. Participation will include both oral presentations and written assignments. Grading for these activities will be done using the appropriate rubrics that will be provided to students.

* Global Engagement – Students will demonstrate a willingness to reflect on their own relationship to the environment and take responsibility to reduce their own ecological footprint as well as engaging in local, global and intercultural environmental problem solving.
  -- Students will evaluate and reflect on their ecological footprint.
  -- Students will participate in an environmentally related co-curricular activity.

Assessment for Global Engagement will take the form of a reflection regarding their personal ecological footprint. In addition, students will participate in a co-curricular activity and will describe their experience in a discussion. Both activities will be evaluated using the appropriate rubrics that will be provided to students.

**Grading Evaluation-Performance Measures/Course Activities**

*Paper* (Individual) 10%-Paper (minimum 3-5 pages) on an area selected from any topic in the book & approved by the instructor. A minimum of 5 references should be used not including the textbook.

*Group Debate* (~6 students/group) 10%-Debate on a controversial environmental issue with a separate 1-page outline by each student of their position.

Individual Ecological Footprint 5%

Co-curricular Activity 5%
Exam I * 20%
Exam II* 20%
Final Exam (cumulative) 30%
Final Grade = the average of all exams and individual and group submissions.
*Make-up exam within a week of date of exam—for Exams I & II only. Attendance is required. We will only have a final during final examination week.

Class Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Readings (Chapters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Environmental Problems/Sustainability</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Science, Matter, Energy</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Ecosystems</td>
<td>3</td>
</tr>
<tr>
<td>4-5</td>
<td>Biodiversity</td>
<td>4, 5</td>
</tr>
<tr>
<td>6</td>
<td>Climate</td>
<td>6</td>
</tr>
</tbody>
</table>

What are the principles of sustainability? How are our ecological footprints affecting the earth? Why do we have environmental problems? What is an environmentally sustainable society?

What do scientists do? What is matter and what happens when it undergoes change? What is energy and how do physical and chemical changes affect it?

What keeps us and other organisms alive? What are the major components of an ecosystem? What happens to energy in an ecosystem? What happens to matter in an ecosystem? How do scientists study ecosystems and make decisions about the health of these systems?

What is biodiversity and why is it important? How does Earth’s life change over time? How do geological processes and climate change affect evolution? How do speciation, extinction, and human activities affect biodiversity? How do species interact? What limits the growth of populations? How do communities and ecosystems respond to changing environmental conditions?

What factors influence climate? How does climate affect the nature and location of biomes? How have human activities affected the world’s aquatic and terrestrial
ecosystems? What are the major types of aquatic systems?

What factors influence the size of the human population? How does a population’s age structure affect its growth or decline? What are the major urban resource and environmental problems?

EXAM 1 - All material covered thus far

What is food security and why is it difficult to attain? How is food produced? What environmental problems arise from industrialized food production?

Will we have enough usable water? How can we increase water supplies? How can we use freshwater water more sustainably? How can we reduce the threat of flooding? What is water pollution and how can we deal with it? What are the new potential forms of water pollution?

Water Pollution continued

Air Pollution/Climate Change/ Ozone Loss

What is the nature of the atmosphere? What are the major air pollution problems? How should we deal with air pollution? How might the earth’s climate change in the future? What are some possible effects of a warmer atmosphere?

Solid and Hazardous Materials, Pesticides (part 1)

What are solid waste and hazardous waste, and why are they problems? How should we deal with solid waste? Why is reusing and recycling materials so important? What are the advantages and disadvantages of burning or burying solid waste?

EXAM 2 — All material covered since Exam I
What types of biological and chemical hazards do we face? How can we evaluate chemical hazards? What is risk? Hazard vs risk? How do we perceive risks and how can we avoid the worst of them?

What role do humans play in the extinction of species? Why should we care about the rising rate of species extinction? How do humans accelerate species extinction? How can we protect wild species from extinction?

What are the major threats to forest ecosystems? How should we manage and sustain forests, grasslands, parks and nature reserves? What is the ecosystem approach to sustaining biodiversity? How can we help to sustain aquatic biodiversity?

**FINAL (cumulative)**

**Course/University Policies:**
You are expected to be on time to class, and to stay the full period. You are expected to maintain high standards of academic honesty.

The University's Code of Academic Integrity (information available at http://academic.fiu.edu/AcademicBudget/misconductweb/1acmisconductproc.htm).

Reference to University policies on sexual harassment, and religious holidays, and information on services for students with disabilities (information available in the Faculty Handbook—link available from Provost’s site (http://academic.fiu.edu/)).

Reference to the University policies on academic misconduct (information available at http://academic.fiu.edu/AcademicBudget/misconductweb/1acmisconductproc.htm).

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange
of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

Instructors retain the right to modify the course syllabus for any reason throughout the semester provided that:
• fair and adequate notice is given to enrolled students either by e-mail, in writing, or through online publishing;
• modifications to the syllabus are not arbitrary or capricious; and,
• students are not unfairly disadvantaged by mid-semester changes to grading standards, attendance standards, or performance measures.