EVPP 110 - Ecosphere: Environmental Science I

Fall 2002 - MW 9:00am-10:15am AQ 102

Instructor: Dr. Kim Largen

Course Goals: "The Ecosphere" is designed as a two-semester lab science sequence (EVPP 110 & EVPP 111) which can fulfill the general education requirements for B.A. students in the College of Arts and Science and other schools and colleges. EVPP 110 is the first semester of this sequence. We will study the components and interactions that make up the natural systems of our home planet with particular attention to the part of the Earth that is home to humans and other life forms. The course will teach basic concepts in biological, chemical, physical, and earth sciences in an integrated format with a combination of lecture, laboratory, and field exercises. Students completing the course are expected to:

- demonstrate an understanding of the basic components of the natural world, the basic laws of natural systems, and how they interact to produce the natural phenomena of planet Earth.
- gain an appreciation of the complexity of natural systems and linkages which can complicate human efforts to manage the environment
- recognize and be able to apply basic scientific concepts such as: hypothesis, experimentation, observation, substantiation, proof, prediction.
- evaluate scientific information and draw appropriate inferences and conclusions from it.
- distinguish between issues subject to scientific analysis and those appropriate to other modes of inquiry.

Course Structure: EVSC is a linked lecture-lab course. The laboratory is an integral part of the course and cannot be taken separately. Traditional lectures will be given in which the instructor will introduce and expand on the weekly topics. Material will come from the text and from other sources. Internet reference sites will be indicated for material not covered by the text. Lab material will complement and elaborate on the lecture. Lab will also be a time for small group activities that facilitate interactions among students and between students and faculty. In lab, students will be introduced to many of the tools used by natural scientists to study the natural environment such as wet chemistry, lab instrumentation, microscopy, sterile technique, field data collection, data logging, data analysis, and utilizing the web for posting and retrieving data and other information. Students will also gain experience evaluation the quality of different sources of "scientific" information.

Course Requirements: Evaluation of student performance in EVSC 110 will integrate components from both lecture and lab. The entire course grade is based on a total of 400 points. The lecture portion of the grade will be worth 300 of

those 400 points. The lab portion of the grade will be worth 100 of those 400 points. The lecture portion of the course grade will be based on **three exams**. Two of these will be given during the semester and the third at the time of the scheduled final (however, the last exam is not cumulative). An exam which was to be given on a day when the university closes due to weather, etc. is automatically rescheduled for the next class day. Each lecture exam will count 100 pts. Make-up exams will be given at the discretion of the instructor and may consistent of any form of assessment the instructor chooses. The lab portion of the course grade will be based on weekly lab exercise write-ups, worth 6-10 points each depending on the complexity of the lab. Attendance at all labs is required and missed labs cannot be made up without the consent of the lab instructor.

Honor Code: EVSC 110 is governed by the GMU Honor Code. All individuals must do their own work on exams. Application of the Honor Code to work in the lab will be explained in the lab syllabus.

Text: **Lecture:** *Environment, 3rd Edition*, by Raven & Berg
Referenced Internet sites
Lab: *EVPP 110 Lab Manual*, edited by Largen
Supplemental handouts

Contacting the instructor:

Dr. Kim Largen
Office Hours:

Monday	8:15am – 8:45am	Room AQ 102 (lecture site)	no phone
Wednesday	8:15am – 8:45am	Room AQ 102 (lecture site)	no phone
Thursday	12:00pm-1:00pm	Room DK 3036	phone 993-1033

Email: klargen@gmu.edu
Instructor's website: http://mason.gmu.edu/~klargen
Course website: http://mason.gmu.edu/~rcjones/110home.htm

Lecture Topics, Reading Assignments, Exam Schedule:

Date	Day	Topic	Required Readings**
8/26	Mon	Course overview, intro to environmental science	R&B Ch 1
8/28	Wed	Environmental challenges, scientific method	R&B Ch2
9/02	Mon	NO CLASS – LABOR DAY	
9/04	Wed	Matter & energy: structure of matter	R&B Appendix I, Web #1
9/09	Mon	Matter & energy: chemical reactions	Web #1*
9/11	Wed	Matter & energy: chemistry of life	Web #2
9/16	Mon	Matter & energy: states of matter, thermodynamics	R&B Ch 4 (p69-71), Web #1, #2
9/18	Wed	Life: origin, characteristics, structure/function cells	Web #2, #3, #4
9/23	Mon	Life: fueling life- cellular respiration & photosynthesis	R&B Ch 4 (p71-73), Web #2, #3, #4
9/25	Wed	Life: levels of organization, classification	R&B Ch 4 (p67-69), Ch5 (p86), Web #2, #3, #4
9/30	**Mon**	**EXAM #1**	
10/02	Wed	Physical environment: origin & structure of earth	Web #5-#11
10/07	Mon	Physical environment: interplanetary processes	R&B Ch 6 (p127-130)
10/09	Wed	Physical environment: atmosphere	R&B Ch 6 (p115-120)
10/14	Mon	NO CLASS – COLUMBUS DAY – CLASS MEETS TUE	
10/15	**Tue**	Physical environment: oceans	R&B Ch 6 (p120-124)
10/16	**Wed**	Physical environment: weather & climate	R&B Ch 6 (p124-127)
10/21	Mon	Biogeochemical cycles	R&B Ch 6 (p106-115)
10/23	Wed	Major biomes	R&B Ch 7 (p133-145)
10/28	Mon	Populations: principals of population ecology	R&B Ch 8 (p168-177)
10/30	Wed	Populations: evolution & natural selection	R&B Ch 5 (p99-100)
11/04	**Mon**	**EXAM #2**	
11/06	Wed	Populations: characteristics of human population	R&B Ch 8 (p177-187)
11/11	Mon	Populations: human population & the environment	R&B Ch 9
11/13	Wed	Communities: principals of communities	R&B Ch 5 (p84-96)
11/18	Mon	Communities: species diversity, succession	R&B Ch 5 (p97-98, 100-103)
11/20	Wed	Ecosystems: principals, flow of energy	R&B Ch 4 (p73-81)
11/25	Mon	Ecosystems: trophic levels, ecological pyramids	R&B Ch 4 (p73-81)
11/27	Wed	NO CLASS – THANKSGIVING BREAK	
12/02	Mon	Energy sources, consumption & conservation	R&B Ch 10, 11, 12
12/04	Wed	Energy sources, consumption & conservation	R&B Ch 10, 11, 12
12/16	**Mon**	**FINAL EXAM 7:30am (non-cumulative)**	

* Web site addresses/URLs are listed on page 4

**Required Readings: Additional web sites may be added throughout the semester

Internet Reading Sites:

Web #	Title	Site Address (URL)
1	Chemistry Tudor	http://library.thinkquest.org/2923/
2	BioChemLinks	http://biochemlinks.com/bclinks/bclinks.cfm
3	Cells Alive	http://www.cellsalive.com
4	Cells II: Cellular Organization	http://gened.emc.maricopa.edu/biol/biol81/BIOBK/BioBookCELL2.html
5	Atmospheric Structure	http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/ATM_CHEM/atmospheric_structure.html
6	Earthquakes (USGS)	http://pubs.usgs.gov/gip/earthq1/
7	Plate Tectonics (Southern California…)	http://scign.jpl.nasa.gov/learn/plate.htm
8	Earthquakes (Southern California …)	http://scign.jpl.nasa.gov/learn/eq.htm
9	Plate Tectonics Animations (USGS)	http://www2.nature.nps.gov/grd/usgsnps/animate/pltecan.html
10	Volcanoes (Earthforce)	http://www.fi.edu/earth/core.html#volcano
11	Lots of stuff	http://www.agiweb.org/earthcomm/fluidspheres/oceans.html#Activity2