

Course Change Request

New Course Proposal

Date Submitted: 01/18/18 4:28 pm

Viewing: **EVPP 545 : Principles of Environmental Toxicology**

Last edit: 01/18/18 4:28 pm

Changes proposed by: gcraft

Catalog Pages
referencing this
course

[Department of Environmental Science and Policy](#)
[Environmental Science and Policy \(EVPP\)](#)

Are you completing this form on someone else's behalf?

Yes

Requestor:

Name	Extension	Email
Jennifer Bazaz Gettys	5302	jbazaz@gmu.edu

Effective Term: Spring 2018

Subject Code: EVPP - Environmental Science & Policy

Course Number:
545

Bundled Courses:

Equivalent
Courses:

Catalog Title: Principles of Environmental Toxicology

Banner Title: Principles Envirn Toxicology

Will section titles
vary by semester? No

Credits: 3

In Workflow

1. **ESP Chair**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost-Graduate
5. Registrar-Courses
6. Banner

Approval Path

1. 01/18/18 4:47 pm
A. Alonso Aguirre
(aaguirr3):
Approved for ESP
Chair

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 3

Repeatable: May only be taken once for credit (NR)

Default Grade Mode: Graduate Regular

Recommended Prerequisite(s):

Courses in ecology, physiology and chemistry; or permission of instructor

Recommended Corequisite(s):

Required Prerequisite(s) / Corequisite(s) (Updates only):

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(Course/Test Code	Min Grade/Score	Academic Level)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Level(s):

Degree(s):

School(s):

Catalog Description:

Explores basic principles of toxicology with an emphasis on the environment, including the history and scope of the field; absorption, distribution, metabolism, and excretion of toxicants; mechanisms of toxic

action; genetic toxicology; and ecotoxicology, as well as specific examples of important toxicants. Introduces regulatory toxicology and human and ecological risk assessment.

Justification:

Currently, EVPP 445 Principles of Environmental Toxicology is offered to undergraduates. This course will cover the same material for graduate students, at the graduate student level of difficulty. Currently, I am teaching EVPP 745 Environmental Toxicology for graduate students, however, according to the experience of the previous instructor (Dr. Jonas) and me, students don't have the principles they need. Next fall semester 2015, EVPP 745 Environmental Toxicology will be offered as a specialized course in selected topics for graduate students who have taken EVPP 545.

Does this course cover material which crosses into another department? No

Learning Outcomes:

Attach Syllabus (PDFs only)

[EVPP445 545 Prin EnTox Syllabus S2016.pdf](#)

Additional Attachments (PDFs only)

Staffing:

German Perilla

Relationship to Existing Programs:

This course explores the social structure, intense cooperation, and organization of honey bees as a natural phenomenon. The main course goals are introducing students to sustainable beekeeping through lecture and hands-on field experience and examining beekeeping as a tool for sustainable development. This course becomes an essential part of undergraduate students in environmental science and sustainability making them understand the role of pollinators in ecosystem services.

Relationship to Existing Courses:

This will complement courses on environmental science and sustainability at several levels. It is highly hands on giving a huge opportunity of field techniques and research.

Additional Comments:

Reviewer Comments

Key: 15580

PRINCIPLES OF ENVIRONMENTAL TOXICOLOGY

EVPP 445_545

BIOL 435_507

3 Credit Hours

GEORGE MASON UNIVERSITY

Spring Semester 2016

Lecture: Tuesdays 4:30-7:10 PM

Enterprise Hall 276

Instructor: Dr. Alonso Aguirre
Office: 3026 David J. King Hall MSN: MSN: 5F2, Fairfax
420 Occoquan Building PW MSN: 4D4, Manassas
Office Hours: Tuesdays & Thursdays 2:00-4:00 pm
or BY APPOINTMENT (send email request)
Phone: 703.993.7069
Cell: 304.200.0145
Email: aaguirr3@gmu.edu
Prerequisite(s): EVPP 110, 111 and CHEM 211, 212 and 60 credit hours; or permission of instructor.

Sign up for Mason Alert (e.g., weather closings, emergencies) at

<https://alert.gmu.edu>

Syllabus

Course Description: According to the University's catalog description, this course "*explores basic principles of toxicology with an emphasis on the environment, including the history and scope of the field; absorption, distribution, metabolism, and excretion of toxicants; mechanisms of toxic action; genetic toxicology; and ecotoxicology, as well as specific examples of important toxicants. Introduces regulatory toxicology and human and ecological risk assessment.*"

Toxicology ("the science of poisons") studies the nature, adverse effects, and biochemical actions of toxic substances in living organisms, with its applications focusing largely on human health issues. Environmental toxicology, as a branch of toxicology, studies the source, detection, transport, effects and occurrence of (potential) toxic substances in the environment, and in any environmentally exposed species. Fundamental toxicological concepts will be covered including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, bioconcentration, biotransformation, biomagnification, biotransformation, bioremediation, and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, carcinogenesis, and risk assessment. The course will include an overview of chemodynamics of contaminants in the environment including fate, transport and bioremediation. We will examine chemicals of environmental interest and how they are tested and regulated. Case studies and special topics will be reviewed.

The course is targeted for upper level undergraduate and graduate students to acquire an understanding of knowledge in environmental toxicology including:

1. The principles for environmental toxicology and major contemporary issues relevant to human and ecosystem health;
2. The classes, nature, distribution, occurrence, transport, interaction, and fate of toxic chemicals released into environment;
3. The basic biological processes and physiochemical mechanisms through which toxicants exert their effects on species and ecosystems;
4. The concepts of risk management and risk assessment as applied to toxic substances in the environment;
5. Those contaminants pertaining to health risk perception, environmental quality, sustainability, regulatory science, and public communication

Method of Instruction: The course objectives will be achieved through didactic lectures and assigned reading, presentations and student discussion. In addition, instructional activities will include interactive discussions of selected topics throughout didactic lectures.

Course Expectations: As with any upper level undergraduate and graduate course offering, *this will not be an easy course*. The successful student **must read assignments, study supporting materials, and prepare assignments outside of class**. Self-directed study skills are important. Students need to organize material logically and communicate well orally and in writing.

Class Preparation

“He who hesitates is lost....” Reading, research, and assignments are detailed on the following class outlines. Any concerns about keeping up with assignments should be discussed with Prof. Aguirre. More students are juggling work, research, internships, shadowing, and families. Please note “Although many students must work to meet living expenses, employment must not take priority over academic responsibilities. Students employed more than 20 hours a week are strongly urged not to attempt a full-time academic load. Students employed more than 40 hours a week should attempt no more than 6 credits per semester. Students who fail to observe these guidelines may expect no special consideration for academic problems arising from the pressures of employment..” (University catalog, section AP.1.2. Academic Load, see: <http://catalog.gmu.edu/content.php?catoid=27&navoid=5365#attendance>). Please consider your responsibilities and interests and plan accordingly to protect your health and GPA!

Class Participation

Students should come to class ready to participate in all activities (assignments completed prior to class). They should behave in a mature and professional manner and abide by the GMU honor code. **Please turn off cell phones or pagers before class begins.**

Absenteeism should be limited to illness or emergencies, or discuss concerns with the instructor. Students should notify the instructor before class if they must miss a class. **Multiple missed classes will affect student grades.** PowerPoint TEXTS will be posted so you have the highlights of each lecture. However, you need to make every effort to attend. Students should contact classmates to obtain lecture notes and assignments, if necessary as quizzes and exams will be based also from readings from the books and other materials. Students may record the lectures (sound), but may not take photographs or videos. Instead, they should take notes, which will help them study for the exams. If using electronic devices (such as laptops, notebooks,

tablets), please be respectful of your peers and your instructor and do not engage in activities that are unrelated to class. Such disruptions show a lack of professionalism and can affect your grade.

If you are a student with a disability and you need academic accommodations, please notify the instructor and contact the Office of Disability Services (ODS) at 703-993-2474. All academic accommodations must be arranged through the ODS.

E-mail Communications

I will send group e-mail messages **via Blackboard** and only to your GMU e-mail account. Students must use their Mason email accounts—"MASONLIVE" account—to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information. Please be sure you check it often and keep your mailbox from getting "over quota".

Required Textbooks

Dong M.H. 2014. *An Introduction to Environmental Toxicology*, 3rd ed. Lash & Temple Publishing, California, USA, 500 pp.

Carson, R. 2002 [1st. Pub. Houghton Mifflin, 1962]. *Silent Spring*. Mariner Books. ISBN 0-618-24906-0. *Silent Spring* initially appeared serialized in three parts in the June 16, June 23, and June 30, 1962 issues of *The New Yorker* magazine.

Required Readings: Required readings for both undergrad and grad students include **all chapters assigned from Dong's book**. In addition, grad students will be required to read handouts and journal articles (as assigned). These are expected to be completed prior to the designated class dates and will be essential for classroom discussions and lectures. Access to some journal articles may require students to conduct searches using virtual or other library facilities.

Chapters 1, 23–27 (will be provided in pdf format) from:

Aguirre, A. A., R. S. Ostfeld and P. Daszak. 2012. *New Directions in Conservation Medicine: Applied Cases of Ecological Health*. Oxford University Press, New York, 646 pp.

Chapters 5 & 26 (will be provided in pdf format) from:

E. Hodgson (ed.). 2004. *A Textbook of Modern Toxicology*, 3rd Ed. John Wiley & Sons, Inc.

In addition, graduate students need to overview websites provided under **Required Readings & Viewings** on the following pages in the Course Syllabus.

COURSE SCHEDULE

Week	Date	Topic	Required Readings & Viewings
1	01/19	Introductions. Course objectives, grading, assignments. Environmental Toxicology in the Context of Conservation Medicine/One Health Scope and Principles in Environmental Toxicology; Toxicology Terms	Dong Ch. 1; Aguirre et al. Ch. 1 SOT Toxicology Terms
2	01/26	Global Environmental Change and Occurrence, and Types of Toxicants	Dong Ch. 2 & 4; Aguirre et al. Ch. 24 Hodgson Ch. 26
3	02/2	Pharmacodynamics/Toxicodynamics; Bioconcentration, Bioaccumulation, & Biomagnification of Persistent Chemicals; Uptake and Distribution of Toxicants	Dong Ch. 6 & 7 GEOSS: http://www.epa.gov/geoss/index.htm
4	02/9	Definitions of Terms Due Environmental Pollution and Regulatory Agencies; Fate and Transport of Toxicants in the Environment	Dong Ch. 3 & 5 Aguirre et al. Ch. 25
5	02/16	Metabolism/Biotransformation of Xenobiotics	Dong Ch. 8 CDC Biomonitoring Program: http://www.cdc.gov/biomonitoring/
6	02/23	Adverse Reactions and Toxic Responses; Factors & Conditions Affecting Toxicity	Dong Ch. 9 & 10 Aguirre et al. Ch. 23 ENTRI http://sedac.ciesin.columbia.edu/entri/
7	03/1	<i>Silent Spring</i> review; Air Pollutants: I. Inorganic Gases II. Particulate Matter	Carson's book due; Dong Ch. 11 & 12 Air Toxicology and Epidemiology: http://www.oehha.ca.gov/air.html
8	03/8	Spring Break	

9	03/15	Take Home Midterm Exam Pesticide & Pesticide Residues	Dong Ch. 15 USEPA Toxics Release Inventory: http://www2.epa.gov/toxics-release-inventory-tri-program
10	03/22	Volatile Organic Compounds Toxic Radioactive Metals	Dong Ch. 13 & 14 Top Ten Toxic Threats: http://www.pollutionproject.org/
11	03/29	Take Home Midterm Exam Due Persistent Toxic Substances	Dong Ch. 16 Green Facts- Air Pollution: http://www.greenfacts.org/en/publications.htm
12	04/5	Environmental Mutagenesis & Carcinogenesis	Dong Ch. 18 Aguirre et al. Ch. 26
13	04/12	First Written Assignment Due; Endocrine Disruptors: Systemic Effects on Reproduction and Behavior Occupational Toxicology/Industrial Chemicals	Dong Ch. 19 & 20; International Environmental Law & Policy: http://www.wcl.american.edu/environment/iel/
14	04/19	Biological and Physiologic Toxic Agents Food Toxicants and Toxic Household Substances	Dong Ch. 17 & 21 Aguirre et al. Ch. 27
15	04/26	Second Written Assignment Due Human Health Aspects of Toxicology & Environmental Health Risk Assessment	Dong Ch. 22 & 23 USEPA Laws and Regulations: http://www2.epa.gov/laws-regulations
16	05/3	Final PPT presentations	

GRADING CRITERIA:

The total grade received for this course will be based on the following assignments and assessments:

Activity	EVPP445/BIOL435 %Contribution to Total Grade	EVPP545/BIOL507 %Contribution to Total Grade
Definitions of Terms (Due February 9)	10%	5%
Extra reading assignments	-	10%
Two written commentaries (1 st due 12 April; 2d due 26 April)	20% (one is optional)	20% (10% each)
Four surprise quizzes (5 given)	20% (5% each)	20% (5% each)
Mid-term Take-home Exam: Actual cases to be answered by transdisciplinary teams (Given 15 March; due 29 March)	25%	20%
Research paper	-	15%
10-minute PowerPoint presentation on a current topic (3 May)	25%	10%
TOTAL	100%	100%

The final grade for undergraduate students will be based on this scale: A = 100–93%, A- = 92–90%, B+ = 89–86%, B = 85–83, B- = 82–80%, C = 79–70%, D = 69–60%, F < 59%. **A CURVE WILL NOT BE APPLIED.**

The final grade for graduate students will be based on this scale: A = 100–90%, B = 89–80, C = 79–70%, D = 69–60%, F < 59%. **A CURVE WILL NOT BE APPLIED.**

COURSE ASSIGNMENTS

Assignments should be prepared neatly (preferably computer-generated). Be sure to proofread your work to double-check facts, grammar, and spelling; use a spelling- and grammar-checking program if possible, but note that you cannot rely solely on it, proofreading is essential! Sloppily prepared assignments can adversely affect your grade, especially if improvement is not noted during the course.

Assignments will not be accepted at all 8 days (next class) after the due date, or after the last day of regular classes, whichever comes first. Grades on all assignments will be counted as part of the final grade. (A score of “0” will be given to assignments not turned in by 8 days (next class) after the due date or the last day of regular classes.)

Definitions of Terms

Each student is expected to identify 100 common terms in environmental toxicology and submit them written by hand. This is a way to expose you to common terminology in toxicology, ecology and the environment hoping that you may remember some of these definitions while writing them.

Written Assignments

In addition to reading and studying the textbook, other books, and journal papers, **undergraduate students will prepare one and graduate students two written assignments of 400 words** not including references drafted as commentaries, comparing, contrasting, or critiquing a technical or popular article recently published (2015) on an environmental toxicology issue (i.e. BP Gulf oil spill, Elk River case, massive dolphin die-off along eastern coast), in the style of *Letters to Science* <http://www.sciencemag.org/site/collections/online/eletters/guidelines.xhtml>

Identify **specific** issues/critiques you have with **an article of your choice from a refereed journal or popular magazine**. This can be something that you found problematic, interesting, ridiculous, missing, etc. and then compare and support your arguments with other sources in the literature. You are **encouraged** to search articles from all sources. Use Web of Science or other journal databases to do additional literature searches.

Make your critiques **explicit and clear**, e.g.: “I find three main critiques in the way this argument was presented.” ... paragraph 1, 2, 3.

Preferable to critique is a piece of **primary** literature, popular magazine or even TV news report, and not a review paper or chapter.

Do not spend too many words describing the intro, methods, conclusions, etc. of the article or report that you are critiquing. Try to give a very **brief** overview of the important points or methods and spend the rest of your paper giving **your own** “two-cents”! A good idea is to end with what you think needs to be done in the future based on your critique. **Don’t be repetitive** with your points, you only have up to 400 words, therefore be concise and clear. Make every word count (this may be one of the big challenges of the assignments and will train you for real manuscript writing with editor-imposed word limits).

Proofread: Review your spelling and grammar before handing your work in! Avoid run-on or ambiguous sentences.

Each paper should be neatly prepared and proofread, especially checking for consistency, completeness, and correctness (Help: The Writing Center, OWL/On-line Writing Lab). Many online grammar resources are available now. This book might help when writing:

Ross-Larson, B. 1996. *Edit Yourself: A Manual for Everyone Who Works With Words*. W.W. Norton & Co., New York, NY.

All statements of fact in your paper need to be referenced to some authority. You can of course get access to that material electronically, BUT the use of web sites as a primary source of information is discouraged. You should be using primary literature (e.g. peer reviewed journal articles) and reports for your authority. Limit web citation to no more than about 25% of the total. Full references (all authors names) should be provided in the Literature Cited section of your paper. As for citation style – use *Letters to Science*, but include all authors in the

Literature Cited portion of the paper. Footnotes are reserved for limited explanatory material only. In the body of the text use numbers with an alphabetized Literature Cited section. Use **proper reference structure**, author-year e.g., “Aguirre et al. (2006) identified cadmium as a major threat to human health” or numbered reference (if you want to save words), e.g. “Cadmium was found as a major threat to human health [1]”.

References:

1. Aguirre AA, SC Gardner, JC Marsh, SG Delgado, CJ Limpus and WJ Nichols. 2006. Hazards associated with the consumption of sea turtle meat and eggs: a review for health care workers and the general public. *EcoHealth* 3:141-153.

Please use Word (either .doc or .docx files only) and email your paper to me at the due date.

PowerPoint Presentation

All students are required to give a 10-min presentation (+2 min of Q&A) via PowerPoint slides on a *contemporary* issue/topic relevant to *Environmental Toxicology* or *Environmental Pollution*. The issues/topics (*but not the contents*) for the presentations are not limited to those covered in the textbook. Choose your favorite toxicant, in a terrestrial or marine species or ecosystem from a newspaper, magazine article, or scientific journal article. In your presentation, provide a brief background of the problem; describe the impacts of this toxicant to wildlife, domestic animals, humans and ecosystems and concerns from an economic, cultural, environmental perspective. Impacts can be considered from species to ecosystems and from molecular to global. Management implications may include discussion of mechanisms of control, government regulation, prevention measures and proactive intervention to control impacts of selected toxic substances.

Presentations will be **12 minutes total** (10 minute presentation and 2 minutes for questions).

The slide presentation “rule of thumb” is 1 slide per minute so plan accordingly. Your 1st slide should be a title slide with your name and title of the talk. Next should be an introduction & overview to the topic followed by more specifics. Next you should discuss the implications of your toxicant and management issues related to environmental toxicology. Finally, you should provide conclusions in which the main points are highlighted.

Presentations will be graded on the clarity of the presentation, the professionalism of the slides, the content of the material presented, and your ability to answer questions posed by classmates and instructor.

Each topic below will get a score ranging from **1** (poor), **2** (good), **3** (very good), **4** (excellent)

Literature Review- Scope of information gathering

Scientific knowledge- How accurate is the information presented

Management Implications- all presentations should address *at least* 3 of the following areas:

- a) Effects of toxicant in species and ecosystems from the molecular to the global, including human health
- b) Economic perspectives
- c) Cultural perspectives
- d) Socioeconomic perspectives
- e) Environmental policy angle
- f) Perspectives from both the development, agriculture and conservation
- g) Public health angles
- h) Solutions to the problems outlined

Conclusions-Conclusions are sound and supported by data

Slides-Slides are well organized, logical, and easy to read and to interpret

Style-Delivery is clear, audible, with proper elocution and eye contact with audience

Time-Speaker adheres strictly to time limit.

Research Paper

Not for Undergrads! Each graduate student will be expected to write a research paper on a contaminant affecting humans, wildlife or domestic animals. The topic should be agreed upon by the instructor and student. The paper shall be a minimum of 10 double spaced typed pages containing the history, science, health implications, bioconcentration, bioaccumulation and biomagnification issues, human dimensions, and management implications of the topic. Grading of the paper will be judged on content, form, and relevancy to the course subject. Further details of the paper will be covered at the time of assignment. Use the journal *EcoHealth* guidelines for length and style of the research papers.

Academic Integrity:

In a way I dislike even bringing up the subject because it might be taken to suggest that students are not to be trusted. However, faculty are advised to include statements about academic integrity with all syllabi. My main concern here is that you act as “professionally” as possible and that you not mistakenly act in manner that would be taken badly. One main issue comes up of course – that is plagiarism. We all know it is easy in most cases to cut and paste others’ words and put them in a document with our names on it. Clearly that is unacceptable. I have had some experience with cases in which students did not know the boundaries of plagiarism and so blundered into problems – sometimes severe ones. So, if you have any question about what is acceptable and what is not, do chat with me. Especially do not wait to work on your papers and presentations so that you feel pressured. Get started early and work consistently on your project.

You may never use others' words verbatim unless you actually quote the author. Even with a citation, verbatim use of others' words is plagiarism. Your goal is to become an expert on your subject and then tell a good "story" about the subject in your own words using referenced authority. Simply stringing together words written by others is not acceptable. Below are some statements from Mason.

MASON ACADEMIC INTEGRITY STATEMENT

GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask me for guidance and clarification.

DIVERSITY

Mason faculty are asked to keep diversity, one of the university's core values, in mind throughout the semester. Here is a link to the [Mason's Diversity Statement](#).

PRIVACY

Student Privacy is governed by the [Family Educational Rights and Privacy Act \(FERPA\)](#) and is an essential aspect of any course. [Instructor responsibilities with respect to student privacy](#) are an important consideration when designing the syllabus, especially—though certainly not exclusively—when it comes to faculty and student digital communication. For that reason, students must use their Mason e-mail. As an employee of the state of Virginia, it is also required that faculty use Mason e-mail when communicating with students.

OTHER USEFUL CAMPUS RESOURCES:

WRITING CENTER: A114 Robinson Hall; (703) 993-1200; <http://writingcenter.gmu.edu>

UNIVERSITY LIBRARIES "Ask a Librarian"

<http://library.gmu.edu/mudge/IM/IMRef.html>

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380;
<http://caps.gmu.edu>

UNIVERSITY POLICIES

The University Catalog, <http://catalog.gmu.edu>, is the central resource for university policies affecting student, faculty, and staff conduct in university affairs.

