Department of Environmental and Occupational Health

http://sph.tamhsc.edu/eoh/

**Interim Head:** Virender Sharma, PhD

The Department of Environmental and Occupational Health is concerned with the health effects of exposures to air and water pollution, pesticides, organic solvents, dusts and physical hazards, which occur in the environment, the home or the workplace.

The department draws from the knowledge generated from disciplines that contribute to recognizing, assessing, and controlling these risks that include epidemiology, toxicology, microbiology, safety engineering, industrial hygiene, medicine, nursing, law and labor economics. The department includes a multidisciplinary core faculty and a large adjunct faculty.

For degree curricula see http://sph.tamhsc.edu/eoh/.

**Faculty**

Benden, Mark, Associate Professor  
Environmental & Occptnl Hlth  
PhD, Texas A&M University, 2006  
MS, Texas A&M University, 1992

Cizmas, Leslie, Assistant Professor  
Environmental & Occptnl Hlth  
PhD, Texas A&M University, 2003

Johnson, Natalie, Assistant Professor  
Environmental & Occptnl Hlth  
PhD, Texas A&M University, 2010

McDonald, Thomas, Professor  
Environmental & Occptnl Hlth  
PhD, Texas A&M University, 1988

Mehta, Ranjana, Associate Professor  
Environmental & Occptnl Hlth  
PhD, Virginia Tech, 2011

Pickens, Adam, Assistant Professor  
Environmental & Occptnl Hlth  
PhD, Texas A&M University, 2008

Sharma, Virender, Professor  
Environmental & Occptnl Hlth  
PhD, University of Miami, 1989

Zuniga, Genny, Associate Professor  
Environmental & Occptnl Hlth  
PhD, Tulane University, 1993

**Masters**

- Master of Public Health in Environmental Health  
- Master of Science in Public Health in Occupational Health

**Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Lecture Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHEO 600</td>
<td>Principles of Environmental and Occupational Health</td>
<td>3.0</td>
<td>3</td>
<td>Overview of nature and magnitude of environmental and occupational disease; sources of exposure, methods of monitoring and modeling exposure; review of target organs and potential effects of specific chemicals; discussion of workplace hazards and monitoring programs.</td>
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<tr>
<td>PHEO 601/MSCI 601</td>
<td>Principles of Basic Medical Sciences</td>
<td>5.0</td>
<td>5</td>
<td>Review of cellular and biochemical functions in human body; technologies for probing cellular functions and structures; plasma membrane, internal membranes and intracellular organelles; gene function; cell metabolism; cell motility and cytoskeleton.</td>
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<tr>
<td>PHEO 603</td>
<td>Introduction to Environmental and Occupational Health for Military Personnel II</td>
<td>3.0</td>
<td>3</td>
<td>The goal of the course is for the student to be able, given a scenario and pertinent information, make sound management decisions and effectively employ public health policy among military public health specialties.</td>
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<tr>
<td>PHEO 605/VAPH 605</td>
<td>Chemical Hazard Risk Assessment</td>
<td>3.0</td>
<td>3</td>
<td>Chemical and biological methods for testing hazardous chemicals and complex mixtures; chemical analysis; microbial bioassays; developmental toxicity; enzyme induction; mammalian cell culture.</td>
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<tr>
<td>PHEO 606</td>
<td>Applied Health Risk Assessment: Humanitarian Settings for Military Personnel</td>
<td>3.0</td>
<td>3</td>
<td>The overall goal of the course is for the student to be able, given a scenario and pertinent information, make sound management decisions and effectively employ public health policy.</td>
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<tr>
<td>PHEO 607</td>
<td>Applied Health Risk Assessment: Operational Risk Assessment and Management for Military Personnel</td>
<td>3.0</td>
<td>3</td>
<td>The overall goal of the course is for the student to be able, given a scenario and pertinent information, make sound management decisions and effectively employ public health policy.</td>
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<tr>
<td>PHEO 610</td>
<td>Basic Environmental Toxicology</td>
<td>3.0</td>
<td>3</td>
<td>Examines basic concepts of toxicology in environmental and occupational surroundings. Distribution, absorption, metabolism and elimination of toxicants are discussed. Mechanisms of injury for various classes of toxicants following exposure to toxic chemicals are explored at the systemic, organ and cellular level.</td>
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**Prerequisites:**

- PHEO 630 or approval of instructor.
PHEO 611 Environmental Health Assessment
Credits 3.3 Lecture Hours.
This course will review methods to evaluate the public health implications of exposures to environmental contamination. These methods are used to determine whether people have been, are being, or may be exposed to hazardous substances and if so, whether that exposure is harmful, or potentially harmful, and should therefore be stopped or reduced. Students will gain insight into the variety of tasks associated with the environmental health assessment process.
Prerequisite: PHEO 600 and PHEB 600.

PHEO 612 International Environmental Health
Credits 3.3 Lecture Hours.
As globalization continues and the earth's natural processes transform local problems into international issues, few societies are being left untouched by major environmental problems. This course addresses some of these environmental problems that developing and underdeveloped countries face due to overpopulation, lack of natural resources, and lack of proper ways or technologies to dispose of hazardous wastes.

PHEO 613 Introduction to Environmental Health Disparities
Credits 3.3 Lecture Hours.
In this online course, the students will learn about the disproportionate burdens of environmental contamination, whether urban or rural, and about the environmental health inequalities affecting communities of color. The course will review the history and politics of environmental justice movements in the U.S., and other parts of the world with a focus on the methods and materials used in the study of environmental racism, environmental risk, and sustainable development. This course presents empirical evidence on distributions of environmental quality and health, enforcement of regulations, access to resources to respond to urban, rural, and industrial problems, and the broader political economy of decision-making around environmental and health issues.

PHEO 614/SCSC 614 Biodegradation and Bioremediation
Credits 3.3 Lecture Hours.
Processes affecting the biodegradation of organic chemicals in the environment; assessment of the utility of various remedial procedures, including biodegradation and bioremediation in site specific situations; methods of site assessment and quantitative risk characterization.
Prerequisite: Organic chemistry or approval of instructor.
Cross Listing: SCSC 614.

PHEO 615 Environmental Measurement
Credits 3.3 Lecture Hours.
Theory and practice of analytical methods used in the study of environmental sciences; data quality of objectives, instrumental and wet chemical techniques used in measurement of environmental quality parameters and contaminants.
Prerequisite: College-level chemistry or approval of instructor.

PHEO 617 Occupational Assessment
Credits 3.3 Lecture Hours.
This course is designed to provide students with an understanding of occupational exposure assessment. Students will gain experience in sample collection for occupational settings and occupational exposure analysis.

PHEO 618 Occupational Safety
Credits 3.3 Lecture Hours.
This course is designed to provide students with an understanding of occupational safety and health topics they will encounter as safety professionals. Students will gain experience and knowledge in the areas of construction safety, fall protection systems, aerial lift safety, emergency response communication, hazard identification, accident investigation techniques, OSHA regulations, their role as a safety professional during an OSHA inspection, workers compensation, safety in rural and developing areas and ethics in safety.

PHEO 630 Environmental/Occupational Diseases
Credits 3.3 Lecture Hours.
Identification, evaluation and quantification of risk factors for environmental and occupational diseases, using classic and current examples of exposures involving chemical, physical and biologic agents. Selection of appropriate design and groups. Exposure assessment, including biomarkers and molecular dosimetry. Genetics, gender, age, socioeconomic and other factors affecting susceptibility.
Prerequisite: College-level mathematics.

PHEO 640 Industrial Hygiene
Credits 3.3 Lecture Hours.
Considers methods to measure and reduce workplace hazards; evaluation of engineering controls and personal protective equipment; includes potential chemical, physical, ergonomic and biological exposures. Review of major legislation affecting workplace environment.

PHEO 645 Health and Safety at Hazardous Waste Sites
Credits 3.3 Lecture Hours.
Course covers OSHA compliance issues related to the protection of personnel engaged in on-site remediation activities. Students who satisfactorily complete the course meet the requirements for initial training under 20 CFR 1910.120 (HAZWOPER) and receive a certificate. Hands-on activities/workshops in the areas of personal protective equipment selection and use, sources of chemical information, decontamination procedures, air monitoring equipment, materials handling, and health and safety planning. Lab fee required.

PHEO 650 Risk Assessment I
Credits 3.3 Lecture Hours.
Introduction to the general methodology of Quantitative Risk Assessment; introduction to methods of modeling exposure and selection of toxicity values, as well as risk characterization. Students utilize case studies to learn the general methods of risk assessment; also reviews the importance of and methods for risk communication and management.

PHEO 655 Human Factors And Behavior-Based Safety
Credits 3.3 Lecture Hours.
Basic understanding of the theory and practice of human factors as well as discussion on behavior-based safety. Topics are presented within the framework of humans as functioning systems.
Prerequisite: Approval of instructor.

PHEO 670 Professional Perspectives in Environmental Health
Credits 1 to 3.1 to 3 Lecture Hours.
The purpose of this course is to study the ethics and values of environmental public health. From a practice standpoint, we will study the 10 essential services of environmental health. We will also discuss three critical varieties of environmental ethics: conservation ethics, environmental justice, and sustainability ethics. In regards to policy, we will explore, Brownfields redevelopment, cleanup, and development and restoration policies.
PHEO 675 Water and Environmental Public Health  
Credits 0 to 3. 0 to 3 Lecture Hours.  
To provide a broad understanding of the elements of water and environmental public health and how these major environmental issues affect our society. It will examine water-related health issues, scientific understanding and causes and associations, and possible future approaches to understanding the major environmental health problems in developed and developing countries.

PHEO 678 Occupational Biomechanics  
Credits 3. 3 Lecture Hours.  
This course will focus on research methods in occupational biomechanics to understand and identify/analyze underlying risks associated with the development of work-related musculoskeletal disorders. Topics will include assessing injury risk, balance and posture control, human motion analysis, muscle activity, fatigue, and ergonomics for special populations such as the aging and obese. Students will become familiar with the use of laboratory experimental methods and existing field-friendly ergonomic evaluation techniques.

PHEO 679 Ergonomics of the Upper Extremities  
Credits 3. 3 Lecture Hours.  
Fundamental topics upon which models for the prevention and control of distal upper extremity disorders are constructed. Focus is on topics including human anatomy, neurophysiology, electrophysiology and worker capacity evaluation.

PHEO 681 Seminar in Environmental and Occupational Health  
Credit 1. 1 Lecture Hour.  
This course reviews the foundational literature on environmental and occupational health (EOH). The course will begin with an introductory look at the literature from broad topics followed by specific reviews of current departmental research topics and those found in industry. The course will also examine the application of EOH in public health research and its application to public health practice and commercialization of ideas for supporting efforts to improve environmental and occupational health.

PHEO 682 Industrial and System Safety  
Credits 3. 3 Lecture Hours.  
Course covers general concepts and techniques of safety upon which more detailed and advanced applications may be based. In addition, concepts will include current system safety analysis techniques, failure mode and effect and fault tree analysis, as well as economic analysis for presentation of alternative solutions for problem solving.  
Prerequisite: Approval of instructor.

PHEO 684 Practicum  
Credits 3 to 6. 3 to 6 Other Hours.  
Field placement experience in which students work closely with a departmental faculty member and appropriate field professional(s), applying skills and techniques acquired through course work. Must be taken on a satisfactory/unsatisfactory basis.  
Prerequisite: Approval of academic advisor.

PHEO 685 Directed Study  
Credits 1 to 3. 1 to 3 Other Hours.  
Student investigation of a topic not covered by other formal courses. May be repeated for a maximum of six credits. Satisfactory/Unsatisfactory grading option or standard grading option to be determined by the instructor and applied to all students registered for the course. Grading option will be determined prior to the first class day, outlined in the course syllabus and not be altered once the course has begun.  
Prerequisite: Approval of student’s academic advisor.

PHEO 686 Directed Research  
Credits 1 to 3. 1 to 3 Other Hours.  
Student research initiative not within the scope of a thesis or dissertation. May be repeated for a maximum of six credits. Satisfactory/Unsatisfactory grade option or standard grading option to be determined by the instructor and applied to all students registered for the course. Grading option will be determined prior to the first class day, outlined in the course syllabus and not be altered once the course has begun.  
Prerequisite: Approval of student’s academic advisor.

PHEO 689 Special Topics In Environmental And Occupational Health  
Credits 1 to 4. 1 to 4 Other Hours.  
Revolving topics seminar in an area of specialization within the department. May be repeated for credit. Satisfactory/Unsatisfactory grading option or standard grading option to be determined by the instructor and applied to all students registered for the course. Grading option will be determined prior to the first class day, outlined in the course syllabus and not be altered once the course has begun.

PHEO 691 Thesis  
Credits 1 to 6. 1 to 6 Other Hours.  
Research for master’s thesis. May be repeated for credit. Satisfactory/Unsatisfactory grade option only.  
Prerequisite: Approval of the student’s academic advisor and department head.

PHEO 695 Doctoral Capstone  
Credits 1 to 9. 1 to 9 Lecture Hours.  
Research for doctoral dissertation. Course may be repeated for credit. Satisfactory/Unsatisfactory grade option only.  
Prerequisites: Approval of student’s academic advisor and department head.