



THE UNIVERSITY OF ARIZONA

Mel & Enid Zuckerman  
College of Public Health

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University of Arizona**

**EHS 604 Modeling Exposures to Environmental Hazards**

**Catalog Description:** Introduction to modeling principles used in environmental health sciences. Concepts covered include basic environmental fate-and-transport modeling commonly used in exposure modeling and human exposure and intake modeling. (3 units)

**Course Topics:**

- Stochastic Processes
- Monte Carlo Methods
- Quantitative Risk Analysis
- Stock-Flow / Systems
- SIR / SIER
- Box Models / Mass Balance
- Reactors
- Applications and Extensions

**Course Objectives:** During this course, students will:

- Understand, develop, and use various commonly used types of models in exposure assessment.
- Understand the differences between deterministic and stochastic models and the advantages/disadvantages to their application in various situations.
- Understand the difference between variability and uncertainty and how to account for these in models.
- Fit distributions to data and develop approaches to dealing with data poor situations.
- Develop and use stochastic exposure models.

**Learning Outcomes (Competencies Obtained):** Upon completion of this course students will be able to:

1. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health
2. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
3. Communicate audience-appropriate public health content, both in writing and through oral presentation
4. Apply systems thinking tools to a public health issue
5. Utilize basic strategies for evaluating or measuring exposure to chemical, physical and biological agents
6. Utilize appropriate technical approaches for conducting environmental and industrial assessments