# BARTON COMMUNITY COLLEGE

**COURSE SYLLABUS**

## GENERAL COURSE INFORMATION

Course Number: HZMT 1912

Course Title: Industrial Hygiene and Toxicology

Credit Hours: 1-3

Division and Discipline: Environmental Technology

Course Description: A review of the research done in determining the systematic health effects of exposures to chemicals. Determination of risk factors, routes of entry, control measures, and acute and chronic effects are discussed.

### CLASSROOM POLICY

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The college assumes that its students and faculty will demonstrate a code of personal honor, which is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom. There will be no eating in the classroom.

The college reserves the right to suspend a student for conduct that is detrimental to the college’s educational endeavors as outlined in the college catalog.

Academic dishonesty on any academic endeavor at Barton Community College will not be tolerated.

Anyone seeking an accommodation under provisions of the Americans with Disabilities Act should notify the college of any special requirements prior to enrollment.

1. **COURSE AS VIEWED IN TOTAL CURRICULUM**

Industrial Hygiene and Toxicology is a required course for the Hazardous Materials Certification program and the Hazardous Materials Management Program. The material provided in this course is used during Environmental Management, Industrial Processes, and Chemical Spills and Release Response courses to develop safe and effective policies regarding the use, storage, and disposal of hazardous materials.

The transferability of all college courses will vary among institutions, and perhaps even among departments, colleges, or programs within an institution. Institutional requirements may also change without prior notification. It is the students responsibility to obtain relevant information from intended transfer institutions to insure that the course the student enrolls in are the most appropriate set of courses for the transfer program..

1. **ASSESSMENT OF STUDENT LEARNING/COURSE OUTCOMES**

Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton as a learning college, in finding ways to improve student learning.

1. Introduction to Environmental Toxicology
2. Toxicology Concepts
3. Dose-Response Relationships
4. Absorption of Toxicants
5. Distribution and Storage of Toxicants
6. Biotransformation and Elimination of Toxicants
7. Target Organ Toxicity
8. Teratogenesis, Mutagenesis, and Carcinogenesis
9. Environmental Toxicants
10. Risk Assessment
11. Occupational Toxicology
12. Pollution and Pollution Control

## COURSE COMPETENCIES

1. Introduction to Environmental Toxicology
2. Define environmental toxicology
3. Describe the history of toxicology
4. Distinguish descriptive, mechanistic, and regulatory disciplines of toxicology
5. Recognize the multidisciplinary approaches to environmental toxicology
6. Summarize the relevance of environmental toxicology to the human species
7. Toxicology Concepts
8. Define toxicity
9. Discuss the different types of toxicity
10. Describe toxicokinetics and toxicodynamics
11. Explain how toxicants are classified
12. Outline the steps involved in toxicity testing
13. Dose-Response Relationships
14. Explain the difference between causal and associative relationships
15. Discuss the role of epidemiology in establishing associative relationships
16. Describe the relationship between dose and response
17. Interpret frequency and cumulative dose-response curves
18. Recognize sub-threshold, threshold, and ceiling effect doses
19. Summarize effective, toxic, and lethal doses
20. Define potency, efficacy, mixed or reversed toxicity, and margin of safet
21. Absorption of Toxicants
22. Describe the ways in which toxicants interact with cells
23. Recognize how the molecular characteristics of toxicants affect entrance into a cell
24. Explain human anatomy as related to integumentary, respiratory, and digestive systems
25. Summarize integumentary, respiratory, and digestive routes of toxicant absorption
26. Distribution and Storage of Toxicants
27. Identify the ways toxicants are distributed in the body
28. Recognize the relationship between a specific route of absorption and the related pathways for distribution of a toxicant
29. Describe the factors affecting distribution of toxicants to tissues
30. Define volume of distribution
31. List the sites for toxicant storage
32. Discuss how storage influences the half-life of a toxicant
33. Biotransformation and Elimination of Toxicants
34. Explain the role of biotransformation in toxicokinetics
35. Describe how biotransformation facilitates the elimination of toxicants or their metabolites from the body
36. Distinguish between phase I and phase II biotransformation reactions
37. Define bioactivation or toxication
38. Identify the tissues responsible for biotransformation reactions
39. List the factors affecting biotransformation in humans
40. Summarize the role of elimination in toxicokinetics
41. Describe processes occurring in the kidney, liver, and lung as related to the elimination of toxicants
42. Target Organ Toxicity
43. Define target organ toxicity
44. Explain the basis for the specificity of organ toxicity
45. Contrast the toxicity mechanisms for various types of toxicity
46. Describe examples of target organ toxicity
47. Discuss the characteristics evaluative procedures for determining toxicity in target organs
48. Teratogenesis, Mutagenesis, and Carcinogenesis
49. Define teratogenesis, mutagenesis, and carcinogenesis
50. Describe the relevance of replication, transcription, and translation to teratogenesis, mutagenesis, and carcinogenesis
51. Summarize the mechanism of action for teratogens, mutagens, and carcinogens
52. Discuss examples of known teratogens, mutagens, and carcinoge
53. Environmental Toxicants
54. Define environmental toxicants
55. Recognize the contribution of environmental toxicants to worldwide morbidity and mortality
56. Discuss representative categories of environmental toxicants, including examples
57. Describe the mechanisms of toxicity within categories of environmental toxicants
58. Risk Assessment
59. Define risk and safety
60. Describe the use of the terms probability and incidence as related to risk
61. Identify factors that contribute to differences in risk perception
62. List the processes of risk assessment
63. Summarize the parameters needed to estimate risk
64. Recognize the importance of risk management
65. Discuss the Safe Human Dose Formula
66. Explain the contributions of environmental toxicology to the survival of all organisms
67. **INSTRUCTOR EXPECTATION OF STUDENTS IN CLASS**

## TEXT AND SUPPLEMENTARY MATERIALS USED IN THE COURSE

1. **REFERENCES**
2. **METHODS OF INSTRUCTION AND EVALUATION**

# ATTENDANCE REQUIREMENTS

# COURSE OUTLINE