

General Education Course Proposal

Proposed Course: HS 161 Environment and Human Health **Units** 3
Prefix No. Title

Department: Health Science **College/School:** CHHS

GE Category (Indicate one category only):

Foundation: A1 ___ A2 ___ A3 ___ B4 ___
 Breadth: B1 ___ B2 ___ C1 ___ C2 ___ D ___ E ___
 Integration: B C ___ D ___ International/Multicultural ___

Existing Course **Revised Course** ___ **New Course** ___

Course Included in Current GE Program ___

New courses require the Undergraduate Course Proposal form in addition to this form.
 Revised courses require the Undergraduate Course Change Request in addition to this form.

Proposed catalog description: Limit course description to 40 words using succinct phrases. Include prerequisites, limitations, lecture/lab hours. Indicate former course number, e.g., (Former Biol 105)

Prerequisites: G.E. Foundation and Breadth Area B. Focuses on prevention and control of disease and injury caused by chemicals, physical hazards and microbes in our environment. Topics include toxic chemicals, food protection, air/ water quality, radiation, hazardous waste, et cetera. G. E. Integration IB. (3 lecture hours)

Enrollment limit per section: 45

Expected number of sections per semester - Year 1 1 **Year 3** 3

Attachments:

1. A statement presenting the ways in which this course meets the Specifications provided in the appropriate section of the General Education Policy as well as in the Policies for Inclusion and Evaluation of General Education Courses.
2. A statement of elements common to all sections of this course, identifying content, objectives, required student activities, grading policy, representative texts, and an approximate schedule for the course. Required student activities include such things as papers, research projects, homework, laboratory and/or studio performance, recitations, participation, attendance, and exams.
3. A typical syllabus for a particular offering of the course.
4. Any special cost factors associated with this course.

Approval for Inclusion in General Education

Anthony M. Moore 5/5/03
 Department Chair Date

Andrew Hoff 5-5-03
 College/School Curriculum Committee Date

Andrew Hoff 8/5/03
 College/School Dean Date

Robert D. Merrill 4/2/04
 General Education Subcommittee Date

Permisal P. 4/2/04
 Associate Provost Date

**Forward Original and TWELVE copies to:
 Associate Provost for Academic Affairs, M/S TA 54**

Attachment 2: Common Elements - General Syllabus

California State University, Fresno

Department of Health Science

Course Syllabus

HS 161: Environment and Human Health (Section #)
Semester, Year

Instructor: Name

Office: San Ramon 2, Room 20

Phone: Instructor's office phone number

Office Hrs: (Instructor's office hrs)

Email: Instructor's email address

Course Description

This course is 3 units and meets from ____ on ____ in ____. The content of this course considers the relationship between chemical, physical, and biological factors in the environment and the health of human populations. Discussion is focused on how we can manipulate or control the environment to prevent human illness and injury. Topics covered include basic concepts in environmental disease, food protection, pests and pesticides, toxic chemicals, noise, radiation, air quality issues, water quality issues, and solid and hazardous waste management. Note: An overview of chemistry principles will be provided, as needed, for students who did not take chemistry for their B1 requirement.

General Education

This course meets General Education requirements for Area IB: Physical Universe and Its Life Forms.

Prerequisites

Completion of General Education Area B requirements.

General Education Goals and Student Learning Outcomes for Area IB

Goal for Area IB: Physical Universe and Its Life Forms

The Integration component of General Education Area IB provides instruction at the upper-division level that integrates material from the lower-division Breadth Area B.

Student Learning Outcomes for Area IB: Physical Universe and its Life Forms

Students completing courses in Area IB will be able to:

1. Relate facts and principles that form the foundations of living and non-living systems
2. Distinguish between science and non-science.
3. Apply scientific methodology including the development and testing of hypotheses, to simple investigations in the physical and life sciences
4. Describe influences of scientific knowledge on the development of the world's civilizations

Course Goals and Objectives

The goals of this course are to provide the student with a conceptual understanding of: 1) how humans interact with their environment, 2) how humans are both the cause and the victims of pollution and contamination, and 3) how chemical, physical, and biological hazards are controlled for several key

areas of concern in environmental health. Upon successful completion of this course, the student will be able to:

1. Explain how disease is spread among and to humans.
2. Describe the concept of emerging disease, and provide past and present examples of these.
3. Identify chemical, physical, and biological factors in the environment that can negatively influence human health, and describe how these factors can harm humans.
4. Outline appropriate prevention and control methods for several different types of hazards.
5. Recognize ethical dilemmas in environmental health.
6. Evaluate the overall effectiveness of environmental health programs and agencies in addressing and solving community, regional, national, or world-wide problems.
7. Describe the intent of major pieces of environmental health law and policy.
8. Assess the scientific basis and validity of environmental problems presented in the media.
9. Integrate skills learned in lower division Area B coursework through the review of: Several microbial agents that cause disease, microbial growth curves in foodborne illness, arthropods and rodents as vectors of disease, graphing of altitude vs temperate effects of the atmosphere in air pollution, shielding for physical phenomena such as noise and radiation, chemical/physical treatment of drinking water, and geological aspects of drinking water sources.
10. Develop a more informed opinion on proposed environmental health legislation and regulation.

Required Text

Author/editor. (date). *Title*. Publisher. ISBN:

Course Topics

	Approximate Time Span
Part 1: Introduction to environmental health. Includes at least all of the following: a. description of environmental health b. environmental hazards affecting nature c. environmental hazards affecting humans	(1-2 weeks)
Part 2: Communicable diseases and their control Includes at least all of the following: a. principles of disease transmission and control b. overview of past and emerging communicable diseases c. overview of past and emerging zoonotic diseases	(1-3 weeks)
Part 3: Foodborne illness and its control Includes at least all of the following: a. overview of microbes and toxicants found in food b. methods to prevent and control foodborne illness c. methods of food preservation	(1-2 weeks)
Part 4: Vectors of disease and their control Includes at least all of the following: a. overview of common vectors of disease b. methods of vector control c. pesticide use and pesticide safety	(1-2 weeks)

- Part 5: Accidents and Physical Injuries (optional topic) (0-1 week)
May include the following:
- past and present importance of accidents and physical injury
 - overview of what causes accidents and where they occur
 - methods of control
- Part 6: Toxic substances (1-3 weeks)
Includes at least all of the following:
- principles of toxicology and chemical exposures
 - overview of dermal and respiratory exposures, and their effects
 - control methods for toxic substances
- Part 7: Noise (1-2 weeks)
Includes at least all of the following:
- principles of sound (noise) transmission
 - overview of types of hearing loss
 - control methods for noise
- Part 8: Ionizing radiation (1-2 weeks)
Includes at least all of the following:
- overview of atomic structure, elements, and isotopes
 - principles of ionizing radiation in its interactions with matter, radioactive decay, and acute and delayed health effects
 - methods of protection for ionizing radiation
- Part 9: The atmosphere (1-2 weeks)
Includes at least all of the following:
- physical and chemical properties of the atmosphere
 - altitude and temperature effects in the atmosphere
 - overview of air movements and inversions
- Part 10: Air pollution (1-2 weeks)
Includes at least all of the following:
- processes producing air pollution
 - classification and sources of air pollution
 - air pollution controls
- Part 11: Water issues (1-3 weeks)
Includes at least all of the following:
- water sources and pollution sources
 - overview of common impurities and drinking water standards
 - overview of treatment methods and water conservation
- Part 12: Solid and hazardous waste (1-2 weeks)
Includes at least all of the following:
- overview of solid waste collection, transport and disposal
 - overview of hazardous waste legislation and past and present issues in hazardous waste
 - treatment/remediation methods for hazardous waste

Examinations

This section of the syllabus will include:

The number of exams and/or quizzes, and the (point) value assigned to each.

The format of exams (multiple choice, essay, etc.) and provisions for makeup exams, if any.

Written Project

- Find a current article (published during the course of this semester) in a newspaper, journal, or magazine on any problematic aspect of environmental health. Once your article and its inherent “problem” are approved, the problem will be your topic. For the purposes of our class, appropriate topics are listed in the table of contents in your text, starting with Chapter 6 on.
- Research the topic further by consulting **at least five (not counting your text)** scholarly sources of information (peer reviewed journal articles, professionally published books or monographs, on-line scholarly journal articles, governmental agency web pages). Your sources should be no more than 5 years old.
- Write a 10-12 page paper including sections with the following bolded headings only:

1. Article Description and Recap. This section should include:

- the bibliographic information for your article,
- a brief recap or summary of the article, and
- a statement or paragraph describing the environmental health problem addressed by your article - this problem will actually be your topic, not the article.

2. Significance of the (Environmental Health) Problem. This section should include:

- how the problem affects people in general (makes them ill, degrades their standard of living, will especially affect children, etc.),
- how the problem has affected you personally, or someone close to you (friend or family member).

This section could also include:

- how/why the problem has application in the geographical area where you live, have lived, or where you have visited,
- any controversy surrounding the topic,
- any ethical dilemmas presented by the topic, etc.

3. Physical Effects in Humans and Harm to Environment. This section should include:

- routes of exposure in humans,
- harm caused to humans (damages the liver, causes birth defects, etc.), and
- harm caused to the environment.

4. Controlling the Problem. How we control the problem (e.g., manipulate the environment, pass legislation, train workers, etc.)

- Format of the paper: Double spaced, one inch margins, 12 point font. Be sure to use the 4 headings noted above. Include a cover page with at least the title of your paper, your name, and the date. Also include at the end of your paper a reference list of your sources. Attached your article (or a copy of your article) to the end of paper. Use APA parenthetical citation format to cite all sources of information in the body of your paper.
- The project is worth 100 points. Grading will be based on the following:
 - a. Finding an interesting, pertinent, current article for your topic (10 points)
 - b. Appropriateness of sources (15 points)
 - c. Proper use of sources in citing (25 points)

- d. Writing style: Ability to write a concise, stimulating, interesting overview of the topic with information in each of the 4 headings (10 points)
- e. Proper writing skills: grammar, spelling, sentence structure, formatting, etc. (40 points)
- **Cover page, the first section (Article Description and Recap), and a copy of the article** should be stapled together as a packet. This packet is to be handed in during class and is **due on March 14, 2002**. The packet will be reviewed for appropriateness of the article and proper writing skills, graded on a 20 point scale (10 points from “a” above and 10 points from “e” above), and given back to you with comments for potential improvement and corrections. The packet elements will then be included with the paper.
- **Entire paper** is to be handed in during class and is **due on April 25, 2002**. Late papers will be graded down 5 points per day. The paper will be reviewed for the parameters in “b through e” above, graded on an 80 point scale, and have these points added to the points received on the above packet for a total of 100 points for the project.

Grading

This section of the syllabus will contain the grading policy for the course, which includes the (point) value for each exam or project, the weighting of items, and the grading scale or basis for grading.

Course and University Policies

Course Policies and Prohibitions: Students are expected to regularly attend class, participate in discussions, and complete all required reading in a timely fashion. Unless otherwise instructed, students are also expected to work independently at all times.

Disruptive Classroom Behavior: Any disruptive or distracting behavior is prohibited, including, but not limited to: Side conversations during lecture, cell phone usage, tape-recording of lecture, bringing visitors or guests to class, use of inappropriate language, or in any way demeaning or disturbing others in the class. (Please refer to the University Policy on Disruptive Classroom Behavior, which can be found in the *Schedule of Courses*).

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in Madden Library 1049 (278-2811).

Cheating and Plagiarism: “Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one’s grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term ‘cheating’ not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating that consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one’s own work.” Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University’s policy regarding cheating and plagiarism, refer to the *Schedule of Courses* (Legal Notices on Cheating and Plagiarism) or the *University Catalog* (Policies and Regulations).

Computers: “At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is

required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from Information Technology Services (<http://www.csufresno.edu/ITS/>) or the University Bookstore. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Subject to Change

This syllabus and the attached schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.

Course Schedule (or Calendar)

HS 161: Environment and Human Health (Section #)
Semester, Year

At a minimum, this part of the syllabus will contain projected dates, deadlines, and/or a schedule for topics, readings, field trips, projects, exams, etc.

Attachment 3: Typical Syllabus

California State University, Fresno

Department of Health Science

Course Syllabus HS 161: Environment and Human Health Spring 2002

Professor: Dr. S. Donohue
Phone: 559-278-4747
Email: sdonohue@csufresno.edu

Office: San Ramon 2, Room 20
Office Hrs: MW 9-10 am
TTh 11-12:30 pm
Other times by appt.

Course Description

This course is 3 units and meets from 12:30 – 1:45 on TTh in San Ramon 6, Room 12. The content of this course considers the relationship between chemical, physical, and biological factors in the environment and the health of human populations. Discussion is focused on how we can manipulate or control the environment to prevent human illness and injury. Topics covered include basic concepts in environmental disease, food protection, pests and pesticides, toxic chemicals, noise, radiation, air quality issues, water quality issues, and solid and hazardous waste management. Note: An overview of chemistry principles will be provided, as needed, for students who did not take chemistry for their B1 requirement.

General Education

This course meets General Education requirements for Area IB: Physical Universe and Its Life Forms.

Prerequisites

Completion of General Education Area B requirements.

General Education Goals and Student Learning Outcomes for Area IB

Goal for Area IB: Physical Universe and Its Life Forms

The Integration component of General Education Area IB provides instruction at the upper-division level that integrates material from the lower-division Breadth Area B.

Student Learning Outcomes for Area IB: Physical Universe and its Life Forms

Students completing courses in Area IB will be able to:

1. Relate facts and principles that form the foundations of living and non-living systems.
2. Distinguish between science and non-science.
3. Apply scientific methodology including the development and testing of hypotheses, to simple investigations in the physical and life sciences.
4. Describe influences of scientific knowledge on the development of the world's civilizations.

Course-specific Goals and Objectives

The goals of this course are to provide the student with a conceptual understanding of: 1) how humans interact with their environment, 2) how humans are both the cause and the victims of pollution and

contamination, and 3) how chemical, physical, and biological hazards are controlled for several key areas of concern in environmental health. Upon successful completion of this course, the student will be able to:

1. Explain how disease is spread among and to humans.
2. Describe the concept of emerging disease, and provide past and present examples of these.
3. Identify chemical, physical, and biological factors in the environment that can negatively influence human health, and describe how these factors can harm humans.
4. Outline appropriate prevention and control methods for several different types of hazards.
5. Analyze ethical dilemmas in environmental health.
6. Evaluate the overall effectiveness of environmental health programs and agencies in addressing and solving community, regional, national, or world-wide problems.
7. Describe the intent of major pieces of environmental health law and policy.
8. Assess the scientific basis and validity of environmental problems presented in the media.
9. Integrate skills learned in lower division Area B coursework through the review of: Several microbial agents that cause disease, microbial growth curves in foodborne illness, arthropods and rodents as vectors of disease, graphing of altitude vs temperate effects of the atmosphere in air pollution, shielding for physical phenomena such as noise and radiation, chemical/physical treatment of drinking water, and geological aspects of drinking water sources.
10. Develop a more informed opinion on proposed environmental health legislation and regulation.

Required Text

Nadakavukaren, A. (2000). *Our global environment: A health perspective* (5th ed.). Prospect Heights, IL: Waveland Press, Inc. ISBN: 1-57766-098-6

Additional Resources

American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th ed.). Washington, DC: Author

Koren, H., & Bisesi, M. (1995). *Handbook of environmental health and safety, vol. I and II* (3rd ed.). New York, NY: Lewis Publishers. ISBN: 1-56670-124-4.

McKinney, M.L., & Schoch, R.M. (1998). *Environmental science: Systems and solutions*. Sudbury, MA: Jones & Bartlett.

Moeller, D.W. (1997). *Environmental health* (Rev. ed.). Harvard University Press.

Moore, G.S. (2002). *Living with the Earth* (2nd ed.). New York, NY: Lewis Publishers. ISBN: 1-56670-585-1.

Salvato, J.A. (1992). *Environmental engineering and sanitation* (3rd ed.). New York, NY: John Wiley & Sons, Inc. ISBN: 0-471-52377-1.

Course Topics

Part 1: Introduction to environmental health.	(1 week)
Part 2: Communicable diseases and their control	(2 weeks)
Part 3: Foodborne illness and its control	(1 week)

Part 4: Vectors of disease and their control	(1 week)
Part 5: Accidents and Physical Injuries	(1 week)
Part 6: Toxic substances	(2 weeks)
Part 7: Noise	(1 week)
Part 8: Ionizing radiation	(1 week)
Part 9: The atmosphere	(1 week)
Part 10: Air pollution	(1 week)
Part 11: Water issues	(2 weeks)
Part 12: Solid and hazardous waste	(1 week)

Examinations

There will be three exams (including the final), each worth 100 points, for an **exam total of 300 points**. The exams will each have 30-40 multiple-choice questions (each worth 2 points), and short answer and essay questions worth 20-40 points. Students are required to provide a Scantron (882-ES) for the multiple-choice portion of each exam.

Exams will cover all written and oral materials presented in class. Expect about 80% of the exam to come from class lecture and discussion and 20% to come from the required reading and assigned handouts.

Students are expected to take the exams at the times and dates outlined in the attached schedule. In the rare event that an emergency should arise, the student **MUST** notify the instructor (by phone message or email) prior to the exam time and date that they will miss the exam. The instructor will then arrange for the student to take a similar exam or otherwise do a makeup. If the instructor is not notified of the absence prior to the test, the student will receive a grade of zero points for the exam.

Written Project

- Find a current article (published during the course of this semester) in a newspaper, journal, or magazine on any problematic aspect of environmental health. Once your article and its inherent “problem” are approved, the problem will be your topic. For the purposes of our class, appropriate topics are listed in the table of contents in your text, starting with Chapter 6 on.
- Research the topic further by consulting **at least five (not counting your text)** scholarly sources of information (peer reviewed journal articles, professionally published books or monographs, on-line scholarly journal articles, governmental agency web pages). Your sources should be no more than 5 years old.
- Write a 10-12 page paper including sections with the following bolded headings only:
 1. **Article Description and Recap**. This section should include:
 - the bibliographic information for your article,
 - a brief recap or summary of the article, and
 - a statement or paragraph describing the environmental health problem addressed by your article - this problem will actually be your topic, not the article.
 2. **Significance of the (Environmental Health) Problem**. This section should include:
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This section could also include:

- how/why the problem has application in the geographical area where you live, have lived, or where you have visited,
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- 3. Physical Effects in Humans and Harm to Environment.** This section should include:
- routes of exposure in humans,
 - harm caused to humans (damages the liver, causes birth defects, etc.), and
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- 4. Controlling the Problem.** How we control the problem (e.g., manipulate the environment, pass legislation, train workers, etc.)
- Format of the paper: Double spaced, one inch margins, 12 point font. Be sure to use the 4 headings noted above. Include a cover page with at least the title of your paper, your name, and the date. Also include at the end of your paper a reference list of your sources. Attached your article (or a copy of your article) to the end of paper. Use APA parenthetical citation format to cite all sources of information in the body of your paper.
 - The **project is worth 100 points**. Grading will be based on the following:
 - a. Finding an interesting, pertinent, current article for your topic (10 points)
 - b. Appropriateness of sources (15 points)
 - c. Proper use of sources in citing (25 points)
 - d. Writing style: Ability to write a concise, stimulating, interesting overview of the topic with information in each of the 4 headings (10 points)
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 - **Entire paper** is to be handed in during class and is **due on April 25, 2002**. Late papers will be graded down 5 points per day. The paper will be reviewed for the parameters in “b through e” above, graded on an 80 point scale, and have these points added to the points received on the above packet for a total of 100 points for the project.

Grading

This course will have three exams (two midterms and one final), each worth 100 points, for an exam total of 300 points. The written project will account for another 100 grade points. Grading will be determined by a statistical curve of the **possible 400 points**. There will be no other assignments or extra credit.

Course and University Policies

Course Policies and Prohibitions: Students are expected to regularly attend class, participate in discussions, and complete all required reading in a timely fashion. Unless otherwise instructed, students are also expected to work independently at all times.

Disruptive Classroom Behavior: Any disruptive or distracting behavior is prohibited, including, but not limited to: Side conversations during lecture, cell phone usage, tape-recording of lecture, bringing visitors or guests to class, use of inappropriate language, or in any way demeaning or disturbing others

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Subject to Change

This syllabus and the attached schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.

Course Schedule Spring 2002

Important Course Dates

- **February 18:** **President's Day Holiday, no class**
- **March 25-29:** **Spring Break, no class**
- **April 1:** **Cesar Chavez Holiday, no class**
- **May 15:** **Last day of formal instruction**
- **Tues, May 21:** **Final exam (1:15 pm)**

Weekly Assignments

Week of	Class Assignment	Reading Assignment
Jan. 21st	Introduction to Environmental Health	
Jan. 28th	Intro & Communicable and Zoonotic Diseases	Chapter 6
Feb. 4th	Diseases (cont.)	
Feb. 11th	Food Protection	Chapter 9
Feb. 18th	Pests and Pesticides	Chapter 8
Feb. 25th	Exam I - 2/26 (+ start material for next exam)	
Mar. 4th	Accidents and Physical Injuries	
Mar. 11th	Toxic Substances (project "packets" due 3/14)	Chapter 7
Mar. 18th	Noise	Chapter 10
Mar. 25 th	Spring Break - no class	
Apr. 1st	Radiation	Chapter 13
Apr. 8th	Exam II - 4/9 (+ start material for next exam)	Chapter 11
Apr. 15th	The Atmosphere and Air Pollution	Chapter 12
Apr. 22nd	Water Supply (project papers due 4/25)	Chapter 14
Apr. 29th	Water Pollution	Chapter 15
May 6th	Solid and Hazardous Waste	Chapter 16
May 13th	Waste (cont.)	
May 20th	Exam III - 5/21, 1:15 pm	

HS 161: Environment and Human Health

	<u>Week</u>	<u>Time (in mins)</u>
Part 1: Introduction	1	
Syllabus Review and Course Overview (30 mins)		30
I. What is Environmental Health? (10 mins)		
A. Environment		5
B. Environmental Health		5
II. Balance of Health (10 mins)		
A. Teeter totter of health		5
B. Environmental manipulation		5
III. Spaceship Earth (25 mins)		
A. Nearly closed system		5
B. Spaceship Earth components		10
C. "Waste" production		5
D. Technology and environmental controls		5
IV. Types of Environmental Hazards Affecting Nature (35 mins)		
A. Pollution (contamination)		5
B. Retrogression		5
C. Habitat destruction		5
D. Soil erosion		5
E. Deforestation		5
F. Desertification		5
G. Wetlands destruction		5
V. Types of Environmental Hazards Affecting Humans (40 mins)		
A. Infectious agents		5
B. Irritants		5
C. Asphyxiants		5
D. Respiratory fibrotic agents		5
E. Allergens		5
F. Metabolic poisons		5
G. Physical agents		5
H. Mutagens, carcinogens, teratogens		5
Part 2: Communicable Diseases and Their Control	2	
I. Definitions (50 mins)		
A. Infectious agent (IA)		5
B. Communicable disease		5
C. Epidemic disease		5

	<u>Week</u>	<u>Time (in mins)</u>
D. Endemic disease		5
E. Zoonosis (zoonotic disease)		5
F. Channels of infection		5
G. Incubation period (IP)		5
H. Carriers		5
I. Reservoir		5
J. Vehicle		5
II. Transmission (10 mins)		
A. Direct		5
B. Indirect		5
III. Disease Control (10 mins)		
A. Source Controls		5
B. Transmission Controls		5
IV. Environmental Controls (30 mins)		
A. Physical and Chemical Controls		10
B. Procedural Controls		5
C. Personal Protective Equipment (PPE)		5
D. Legislative or legal Controls		5
E. Vaccination and Prophylactic Measures		5
V. "Human-to-Human" Diseases (50 mins)		
A. Tuberculosis (<i>Mycobacterium sp.</i>)		10
B. Hepatitis B (hepatitis B virus)		10
C. Typhoid Fever (<i>Salmonella typhi</i>)		10
D. Salmonellosis (<i>Salmonella sp.</i>)		10
E. Dysentery		10
VI. Zoonotic Diseases (50 mins)	3	
A. Rabies (virus)		5
B. Anthrax (<i>Bacillus anthracis</i>)		10
C. Brucellosis		5
D. Leptospirosis (<i>Leptospira sp.</i>)		5
E. Taeniasis = tape worm		10
F. Q-Fever (<i>Coxiella burnetii</i> , a rickettsial organism)		5
G. Trichinosis (<i>Trichinella spiralis</i> , a nematode)		10
Part 3: Foodborne Illness and Its Control	3 (cont.)	
I. Types of Toxicants Found in Food (100 mins)		
A. Chemicals:		15
B. Plant and Animal Toxins:		15
C. Microbial Infections:		20
D. Microbial Intoxications:		20
E. Toxicoinfections:		20
F. Parasites:		10

	<u>Week</u>	<u>Time (in mins)</u>
II. Methods to Prevent and Control FBI (50 mins)	4	
A. Preventing Contamination		25
B. Preventing Microbial Growth and Survival		25
III. Food Preservation (50 mins)		
A. Moisture Out		10
B. Microbial Action		5
C. Smoking		5
D. Use of Heat (Appertization)		10
E. Use of Cold (Refrigerating and freezing)		10
F. Chemical Additives		5
G. Ionizing Radiation		5
Part 4: Vectors of Disease & Their Control	4 (cont.)	
I. Flies (25 mins)		
A. Importance		5
B. Life Cycle		5
C. Major Types and Diseases		10
D. Control		5
II. Mosquitoes (25 mins)		
A. Importance		5
B. Life Cycle		5
C. Major Types and Diseases		10
D. Control		5
III. Cockroaches (25 mins)	5	
A. Importance		5
B. Life Cycle		5
C. Major Types and Diseases		10
D. Control		5
IV. Rodents (25 mins)		
A. Importance		5
B. Signs of an Infestation		5
C. Major Types and Diseases		10
D. Control		5
V. Ticks (25 mins)		
A. Importance		5
B. Life Cycle		5
C. Major Types and Diseases		10
D. Control		5

	<u>Week</u>	<u>Time (in mins)</u>
VI. Types of Vector Control (35 mins)		
A. Natural		5
B. Mechanical/Physical		5
C. Environmental Manipulation		10
D. Legal Controls		5
E. Biological Control		5
F. Chemical (Pesticidal) Control		5
VII. Pesticides (40 mins)		
A. What are they used against?		5
B. How are they used?		5
C. Where are they used?		5
D. Who regulates their use?		5
E. Classification of Insecticides		5
F. Modes of Action of Poisons (in insects)		5
G. Routes of Exposure (in humans)		5
H. Toxicity and Hazard		5
EXAM I (50 mins)	6	50
Review of Exam (20 mins)		20
Part 5: Accidents and Physical Injuries	6 (cont.)	
I. Importance (30 mins)		
A. Historical Ranking		5
B. Ranking by Age		5
C. Ranking by Type		5
D. Ranking by Gender		5
E. The Good News!		10
II. What Causes "Accidents" (30 mins)		
A. Unsafe things:		10
B. Unsafe conditions:		10
C. Unsafe actions:		10
III. Where Accidents Occur (20 mins)		
A. Home:		5
B. Motor Vehicles:		5
C. Workplace:		10
Part 6: Toxic Substances	7	
I. Chemical Exposures (in general) (65 mins)		
A. Sources of chemical exposures		25
B. Dose-response relationship		10
C. Threshold value		5
D. LD-50		10

	<u>Week</u>	<u>Time (in mins)</u>
E. Exposure types		5
F. Routes of Exposure		10
II. Dermal Exposures (85 mins)		
A. Skin Structure		20
B. Defense Mechanisms of the Skin		15
C. Effects of Dermal Exposures		10
D. Dermal Hazard Categories		40
III. Respiratory Exposures (100 mins)	8	
A. Types of Respiratory Exposures		
1. Irritants		20
2. Fibrotic agents		20
3. Febrile agents		5
4. Systemic poisons		5
5. Allergens		5
6. Bacterial or fungal agents		10
7. Granuloma agents		5
8. Asphyxiants		10
B. Reactions of our respiratory system to airborne particulates and gases		20
IV. Industrial Control Methods for Toxics (50 mins)		
A. Substitution		10
B. Alteration		5
C. Isolation		5
D. Wet methods		5
E. Local exhaust ventilation		5
F. General ventilation		5
G. General sanitation		5
H. Education and training		5
I. Special measures		5
Part 7: Noise	9	
I. Introduction (50 mins)		
A. Sources of noise		10
B. Effects on humans		10
C. Definitions		30
II. Types of Hearing Loss (35 mins)		
A. Otitis media		5
B. Otosclerosis		5
C. Ototoxicity		5
D. Noise-Induced Hearing Loss (NIHL)		20
III. Noise Control (15 mins)		
A. Residential Regulations		5
B. Occupational Regulations		5

	<u>Week</u>	<u>Time (in mins)</u>
C. OSHA Control Hierarchy		5
Part 8: Ionizing Radiation	9 (cont.)	
I. Atomic Structure (40 mins)		
A. Nucleus:		5
B. Electron:		5
C. Element:		15
1. Atomic #		
2. Mass #		
3. Element represented as:		
D. Isotopes:		15
II. Interactions of Ionizing Radiation (10 mins)		
A. Ionization:		5
B. Excitation:		5
III. Radioactive Decay and Decay Products (50 mins)	10	
A. Radioactive decay:		10
B. Half-life:		10
C. Alpha decay:		10
D. Beta decay:		10
E. Gamma (γ) radiation:		10
IV. Radiation Units (30 mins)		
E. Roentgen, R		5
F. Gray (Gy)		5
G. Sievert (Sv)		5
H. "Average Biological Effect" (Q) Chart		15
V. Acute Health Effects (20 mins)		
A. Sample effects		10
B. Cellular sensitivities		10
VI. Delayed Effects (20 mins)		
A. Somatic effects		10
B. Genetic effects		10
VII. Protection (30 mins)		
A. Limit time of exposure		10
B. Increase distance		10
C. Shielding		10

	<u>Week</u>	<u>Time (in mins)</u>
EXAM II (50 mins)	11	50
Review of Exam (20 mins)		20
Part 9: The Atmosphere	11 (cont.)	
I. Composition of Clean, Dry Air (10 mins)		10
II. Altitude Effects in the Atmosphere (20 mins)		
A. Troposphere		10
B. Stratosphere		10
III. Temperature Effects in the Atmosphere (20 mins)		
A. Solar radiation		10
B. Greenhouse Effect		5
C. Shadowing Effect		5
IV. Air Movement (30 mins)		
A. Types of Air Movement		20
B. Inversions		10
Part 10: Air Pollution	12	
I. Definitions (5 mins)		5
A. Air:		
B. Air Pollution:		
II. Air Contaminates (US) (10 mins)		
A. Natural Sources		5
B. Anthropogenic Sources:		5
III. Processes Producing Air Pollution (35 mins)		
A. Attrition or Abrasion:		10
B. Vaporization:		10
C. Combustion (two types):		15
IV. Classification of Contaminants in Air (30 mins)		
A. By How They are Derived:		10
1. Primary contaminants		
2. Secondary contaminants		
B. By Their Form or Physical State		20
1. Particulates (4 types):		
2. Gases:		
V. Sources of Air Pollution (20 mins)		
A. Anthropogenic Sources of Air Pollution (US)		10
B. Regional Smog		10

	<u>Week</u>	<u>Time (in mins)</u>
VI. Air Pollution Controls (50 mins)		
A. Natural Controls		20
B. Legal Controls		10
C. Artificial Controls		20
Part 11: Water Issues	13	
I. Water Sources (50 mins)		
A. Hydrologic Cycle		15
B. Surface Water		5
C. Groundwater		20
D. Saltwater Intrusion		10
II. Drinking Water Supply (100 mins)		
A. Common Impurities		50
1. Microorganisms:		
2. Inorganic material:		
3. Dissolved salts:		
4. Metals:		
5. Gases:		
6. Algae and aquatic plants:		
B. Drinking Water Stds: Safe Drinking Water Act (SDWA)		50
1. Microbiological:		
2. Primary standards:		
3. Secondary standards:		
4. Other parameters:		
III. Drinking Water Treatment (100 mins)	14	
A. Hardness		10
B. Iron & Manganese		10
C. Algae		10
D. Suspended particles		10
E. Gases		10
F. Salts		20
G. Microbes		30
IV. Pollution Sources (40 mins)		
A. Surface Water		10
B. Groundwater		30
V. Water Conservation (10 mins)		10
Part 12: Solid and Hazardous Waste	15	
I. Background (10 mins)		10
A. Solid waste		

	<u>Week</u>	<u>Time (in mins)</u>
B. Sources		
C. Disposal alternatives		
D. Composition of municipal waste		
II. Collection & Transport (10 mins)		10
A. Sanitary landfill costs		
B. Storage container requirements		
C. Frequency of collection		
D. Transportation		
III. Disposal Methods (30 mins)		
A. Sanitary landfill		10
B. Incineration:		10
C. Reclamation		10

Hazardous Waste

I. Issues in Hazardous Waste (15 mins)		
A. Historic Mishaps		5
B. Potential for Human Harm		5
C. Potential for Environmental Harm		5
II. Legislation (20 mins)		
A. Federal		10
1. Resource Conservation & Recovery Act (RCRA), 1976 Hazardous and Solid Waste Amendment (HSWA), 1984		
2. Comprehensive Env. Response, Compensation & Liability Act (CERCLA), 1980 Superfund Amend. & Reauthorization Act (SARA), 1986		
B. California		10
1. Hazardous Waste Control Law (HWCL), 1972		
2. Hazardous Substance Account Act (HSAA), 1981		
3. SB 14: Haz Waste Source Reduction & Mgmt. Review Act of 1989		
III. Treatment Methods (10 mins)		10
IV. CA Optimal Hierarchy of Hazardous Waste Management (5 mins)		5

EXAM III (2 hours)

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