

Professor M. Pirbazari

## Introduction to Environmental Engineering

How well did you learn?				
Not at all → Very Well				
1	2	3	4	5
<b>CIRCLE YOUR RATINGS</b> ↓ BELOW ↓				

COURSE OBJECTIVES AND OUTCOMES					
Basic concepts of environmental engineering, local and global environmental pollution; scientific, social, legal and political aspects of environmental issues; air/water/land pollution and control technologies.					
<b>Objective:</b> To study environmental problems, their causes, and sustainability					
<b>Outcome:</b> The student will be able to understand					
1	The root causes of environmental problems	1	2	3	4 5
2	The principal types of pollution and how they can be reduced or prevented	1	2	3	4 5
3	The natural resources( renewable, nonrenewable, and perpetual) and sustainability	1	2	3	4 5
4	Living more sustainably	1	2	3	4 5
<b>Objective:</b> To study science, matter, and energy					
<b>Outcome:</b> The student will be able to understand					
5	The law of conservation of matter and types of energy	1	2	3	4 5
6	The laws of thermodynamics (first & second) and their applications to the environment	1	2	3	4 5
7	Matter recycling and reuse economies	1	2	3	4 5
8	How to live more sustainably	1	2	3	4 5
<b>Objective:</b> To study ecosystems and how they work					
<b>Outcome:</b> The student will be able to understand					
9	Energy and matter in ecosystems	1	2	3	4 5
10	Biogeochemical cycles (carbon, water, nitrogen, phosphorus, and sulfur)	1	2	3	4 5
11	Food chain, food web and diversity of organisms	1	2	3	4 5
12	Effects of human activities on biomes (terrestrial and aquatic)	1	2	3	4 5
<b>Objective:</b> To study air pollution, global warming and ozone loss					
<b>Outcome:</b> The student will be able to understand					
13	Photochemical smog and air pollution	1	2	3	4 5
14	Harmful effects of air pollutants on humans, plants, buildings, etc.	1	2	3	4 5
15	Air pollution prevention and control strategies (particulate matter and gaseous pollutants)	1	2	3	4 5
16	Global warming, its causes, and strategies to reduce it	1	2	3	4 5
17	Ozone hole and strategies to prevent it	1	2	3	4 5
<b>Objective:</b> To study water resources and water pollution					
<b>Outcome:</b> The student will be able to understand					
18	World's freshwater supplies and associated problems	1	2	3	4 5
19	Water pollution problems in rivers, lakes, oceans and groundwater	1	2	3	4 5
20	Treatment of surface water containing turbidity	1	2	3	4 5
21	Treatment of domestic wastewater	1	2	3	4 5
22	Prevention and reduction of water pollution	1	2	3	4 5

# Introduction to Environmental Engineering

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**COURSE OBJECTIVES AND OUTCOMES**

**Objective:** Design of a simple water treatment plant

**Outcome:** The student will be able to understand the

23	Fundamental hydraulic design of pipes	1	2	3	4	5
24	Design of a pre-sedimentation tank	1	2	3	4	5
25	Design of rapid-mix tank for chemical addition	1	2	3	4	5
26	Design of flocculation tank	1	2	3	4	5
27	Design of sedimentation tank	1	2	3	4	5
28	Design of chlorination tank	1	2	3	4	5

content of the curriculum and prepare the students to utilize what they learn in a professional setting.

Engineering

projects and research activities enlist skills and demonstrate ability to understand the subject matter and communicate in a proficient manner. This course contributes to the overall program goals in the following ways.

**Outcome.** Engineering programs must demonstrate that their students attain

a	An ability to apply knowledge of mathematics, science, and engineering	1	2	3	4	5
b	An ability to design and conduct experiments, as well as to analyze and interpret data	1	2	3	4	5
c	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	1	2	3	4	5
d	An ability to function on multi-disciplinary teams	1	2	3	4	5
e	An ability to identify, formulate, and solve simple engineering problems	1	2	3	4	5
g	An ability to communicate effectively	1	2	3	4	5
h	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	1	2	3	4	5
i	A recognition of the need for, and an ability to engage in life-long learning	1	2	3	4	5
j	A knowledge of contemporary issues	1	2	3	4	5
k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	1	2	3	4	5