**UNIVERSITY OF SARGODHA**

**DEPARTMENT OF SOIL & ENVIRONMENTAL SCIENCES, UNIVERSITY COLLEGE OF AGRICULTURE**

COURSE OUTLINE **Fall 2020-21**

Course Title: Environmental pollution and management

Course Code: SES-403

Credit Hours: 3(3-0)

Instructor: Dr. Mukkram Ali Tahir

Email: rai786@gmail.com

|  |
| --- |
| **DESCRIPTION AND OBJECTIVES** |

The aim of this course is to teach students regarding the soil, water and air pollution and impact on soil and human health. Soil serves as an interface between water and environment. Therefore, role of soil in causing pollution and protecting from environmental pollution is very important in environmental pollution management. At the completion of this course, students will be able to understand;

1. Soil, water and air pollution and its impact on crop growth and environment.
2. Management and control: Public awareness, control measure at source, soil and water treatment.
3. Legislation and socio-economic issues of environmental pollution.

|  |
| --- |
| **INTENDED LEARNING OUTCOMES** |

After completion of this course, students will be able to understand various types of environmental pollutions particularly soil, water and air pollution. Students will get in insight about causes, sources and remedies along with management of various types of environmental pollution.

|  |
| --- |
| **COURSE CONTENTS** |

**Theory**

1. Introduction to soil, water and air pollution
2. Sources and causes of pollution
3. Types of pollutants: Inorganic, organic and radioactive
4. Fate of pollutants: Adsorption, precipitation, degradation, movement and plant uptake
5. Degradation of pollutants: Chemical, biological and light
6. Factors affecting movement of pollutants in soil
7. Impact of pollutants on soil, plant, animal and human health
8. Water pollution: Drinking and irrigation; BOD, COD and eutrophication
9. Atmospheric pollutants; Green house gases
10. Strategies for pollution control
11. Management and control: Public awareness, control measure at source, soil and water treatment
12. Legislation and socio-economic issues of environmental pollution

|  |
| --- |
| **READINGS** |

1. Harrison, R.M. (ed.). 2001. Pollution: Causes, Effects and Control. 4th Ed. The Royal Society of Chemistry, Cambridge, UK.
2. Huggett, R.J. 1997. Environmental Change. Rovtledge, London, UK.
3. Raven, B., L.R. Berg and D.M. Hassenzahl. 2008. Environment. 6th Ed. John Wiley & Sons, NY, USA.
4. Clinic, C., M. Ignazio and G.M. Lodovica. 2008. Sustainable Development and Environmental Management: Experiences and Case Studies. 1st Ed. Springer Publishers, Dordrecht, TheNetherlands.
5. Cunningham, W.P., M.A. Cunningham and B.W. Saigo. 2007. Environmental Science: A global Concern. 9thEd. McGraw Hill, NY, USA.
6. Asthana, D.K. and M. Asthana. 2003. Environment Problems & Solutions. S. Chand & Co. Ltd. New Delhi.

|  |  |
| --- | --- |
|  **COURSE SCHEDULE** |  |
| **Week** | **Topics and Readings** | **Books with Page No.** | **Dates** |
|  | Course Outlines: Introduction and importance of the course, General introduction to environmental pollution | Environmental policies for agricultural pollution control. Page 1-18 | 12-10-2020to16-10-2020 |
|  | What is environmental pollution, pollutants, Introduction to air pollution, soil pollution, water pollution | A Textbook of Environmental Studies. Page 267-286 | 19-10-2020to23-10-2020 |
|  | Air pollution; types and sources, Outdoor air pollution sources; impact and control, Indoor air pollution sources; impact and control | Living in the environment. Page 418-445 | 26-10-2020to30-10-2020 |
|  | Causes of air pollution, remedies or management of air pollution, various techniques for control of air pollution | Living in the environment. Page 418-445 | 02-11-2020to06-11-2020 |
|  | Carbon sequestration, role of biochar in carbon sequestration, international carbon trading | Living in the environment. Page 418-445 | 09-11-2020to13-11-2020 |
|  | Water pollution; Types and sources of water pollution | Living in the environment. Page 483-491 | 16-11-2020to20-11-2020 |
|  | Water pollution; causes of water pollution, control and management of water pollution | Living in the environment. Page 483-491 | 23-11-2020to27-11-2020 |
|  | What are pollutants; Types of pollutants: Inorganic, organic and radioactive, Organic pollutants, Radioactive pollutants,  | Environmental policies for agricultural pollution control. page 1-18 | 30-11-2020to04-12-2020 |
|  | Fate of pollutants: Adsorption, precipitation, degradation, movement and plant uptake | Environmental policies for agricultural pollution control. page 1-18 | 07-12-2020to11-12-2020 |
|  | MID-TERM |  | 14-12-2020to18-12-2020 |
|  | WINTER BREAK |  | 21-12-2020to25-12-2020 |
|  | Degradation of pollutants; chemical, biological and light | Pollution: Causes, Effects and Control. 4th Ed. Harrison. 2001 | 28-12-2020to01-01-2021 |
|  | Factors affecting movement of pollutants in soil, impact of pollution on soil and plant health | Pollution: Causes, Effects and Control. 4th Ed. Harrison. 2001 | 04-01-2021to08-01-2021 |
|  | Drinking water pollution, irrigation water pollution, chemical oxygen demand | Pollution: Causes, Effects and Control. 4th Ed. Harrison. 2001 | 11-01-2021to15-01-2021 |
|  | Biological oxygen demand, eutrophication, causes, effects, control and management | Living in the environment. Page 430-445 | 18-01-2021to22-01-2021 |
|  | Soil pollution; Types and sources of soil pollution, Soil pollution; causes of soil pollution, control and management of soil pollution, Impact of soil pollution on plants, animal, human and wider environment | Pollution: Causes, Effects and Control. 4th Ed. Harrison. 2001 | 25-01-2021to29-01-2021 |
|  | Green house effect, green house gases, classification, sources of emission, control and management | Living in the environment. Page 430-445, Air pollution and plant life. Page 43-49 | 01-02-2021to05-02-2021 |
|  | Legislation and socio-economic issues of environmental pollution, Public awareness about pollution | Environmental Law. Page 43-53 | 08-02-2021to12-02-2021 |
|  | FINAL-TERM |  | 15-02-2021to19-02-2021 |
| **RESEARCH PROJECT/PRACTICAL/LABS/ASSIGNMENTS** |  |

**Assignment**

1. Visit to various industries and collection of information regarding their waste management
2. Visit to vegetable markets, solid waste units and agro based industries

|  |
| --- |
| **ASSESSMENT CRITERIA** |

Sessional: 12 (project, presentation, participation)

Project: 06

Presentation: 03

Participation: 03

Mid exam: 18

Final exam: 30