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**Department of Soil and Water**

**College of Science**

**University of Salahaddin**

**Subject: Soil and Water Pollution – 3rd Stage**

**Lecturer's name PhD. Ismaeel Tahir Ahmed**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | Autumn – 2nd semester |
| **2. Lecturer in charge** | Asst. Prof. Dr. Ismaeel Tahir Ahmed |
| **3. Department/ College** | Soil & water / Agriculture Engineering Science  |
| **4. Contact** | e-mail: ismaeel.ahmed@su.edu.krdTel: 0750 476 0935 |
| **5. Time (in hours) per week**  | Theory: 2 Practical: 6  |
| **6. Office hours** | Availability of the lecturer to the student during the week |
| **7. Course code** | 2 |
| **8. Teacher's academic** **profile**  | 1990 - BSc – Mosul Univ. Agriculture College –Soil Science Dept.2005- MSc – Salahaddin Univ. Agriculture College – Soil and Water Dept.2012- PhD. – Salahaddin Univ. Science College -Biology  Dept.  |
| **9. Keywords** | Soil, Water ,Pollution |
| **10. Course overview:** * Collecting the information about of all the environmental changes were happened in the world in (30) lectures were declared in the syllabus.
* At the definition of Environmental sciences with all sides have the relations with the contain or essentials contents of the environment (Weather and Climate).
* Studying all the affects surrounding the environment and the cycle of most of the metals and nutrients and the level of environmental safety.
* The relationships between ecology with other different sciences.
* Giving information's about succession, habitat, community and all its steps.
* How the station working, Equipments, instruments, tools -----.
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| **11. Course objective:**Collecting the suitable information for all environmental categories (Air, Water and Soil) Protecting the green and safety environment and all the elements which have the relation with our environment and its specially cycle of them with its effects on the human life good or bad effect. |
| **12. Student's obligation**1- The student must be already in the lecture.2- The student must success in the average of the two examination were must be done.3- Prepare the report and presentation about one of the titles were taken the lectures  or syllabus. 4- Quizzes must be done weekly**.** |
| **13. Forms of teaching**1- Data show and power point.2- White board.3- Papers (Which collected all the lectures ) |
| **14. Assessment scheme** Final grade will be derived as follows: * **Quizzes and homework's**: About 10 quizzes will be given throughout the semester. They will be given at the beginning of the class period and last 10 minutes. 3-5% of your grade.
* **Exams**: There will be two closed book exams given throughout the semester. Each test will be scheduled for 60 minutes.15 % of grade.
* **Final Exam:** The Final Exam is Comprehensive in all course outlines. 50% of your grade.

Mean of two examinations (Theoretical Part) - 15% Practical part - 35% = 50% Final examination: = 50% |
| **15. Student learning outcome:**1-Taking knowledge about the main characteristics of the environment.2-The impotency of environment.3-Personal ability and its responsibility against the environment.4-All processes were happened of the station meteorology like rainfall quantity and the  period of sunshine and evaporation rate ------, 5- At the end must the student feel what's the duty of one of them, like each academic  person and take the information of development countries. |
| **16. Course Reading List and References‌:**▪ **Key references:**1. **Alloway**, **B. J.** (1995). Heavy metals in soils (2nd Ed.). London: Blackie
2. **Mirsal**, I.A. (2008).Soil pollution Origin, monitoring & remediation (2nd Ed), Springer Ahren, C. Donald. (2002). Essentials of meteorology. Oxford University Press. New york.USA.
3. Ricklefs, R.E. and Miller, G.L. (2000). Ecology. 4th. Ed. W.H. Freeman and Company. USA.
4. Sharma, P.D. (2009). Ecology and environment. Pastogi Publications. India.

**▪ Useful references**:1. Gordon, D. and Kevin, M. (2007). Ecosystems. 2nd. Ed. May, Robert M., and

 Angela R. 1. McLean. (2009). Theoretical Ecology -Principles and Applications. Oxford

 University Press. New york.USA.1. Pugnaire, Francisco. and Fernando Valladares.( 2007). Functional plant ecology. CRC press. USA.

▪ **Magazines and review (internet):** The core materials of the course consists of the above book, articles from media and internet, and lecture’s notes, make sure you read all the materials and prepare well before going for the examinations. Students are encouraged to search for any other materials that may help improve their English language ability in reading, writing, listening and speaking plant communities' texts |
| **17. The Topics** | **Lecturer's name** |
| 1- Understanding the phrases about the Environment,  pollution. The objectives of this course study.1. Pollution Science relation with other sciences Atmosphere \*Structure of atmosphere and its layers \*Types of pollution\* pollutant\* Pollutant classes.
2. Stationary pollution source, Air polluted classification, Air pollutants (CO, CO2, CO, SO2, NOx, H2S, and Hydrocarbons).
3. Things you can do for clean air ,Control of air pollution \*Control gaseous emission \*Control Oxide of Nitrogen\* Control Oxide of Sulphur\*General methods.
4. Acid Rain , Acid rain effect, The greenhouse effect.
5. Water pollution definition, Sources of water pollution. Elements of aquatic ecology. Heavy metals and toxic substances.
6. Soil pollution. Pollutants of Agrochemical Sources: Pesticide Ecology. Soil Pollution through Biological Warfare.
7. Solid Waste.
8. Visual pollution. 26- Light pollution.

10 -Noise pollution. The concept of sound. Sound pressure and level,  frequency, and propagation. 11-12-13- Effect of pollution on different aquatic ecosystems | Dr. Ismaeel Tahir AhmedWeekly (2)hrs  |
| **18. Practical Topics (If there is any)** |  |
| **19. Examinations:*****Q1) Write True or False of the following statements, with correcting the false sentences.* (30M)**1. Air pollution turns clear, odorless air into hazy, smelly air that harms health, kills plants, and damages property.
2. Carpool it means (method of cooperative travel in which each member takes a turn bringing the group to the workplace or school in his own car).
3. Soil pollution is any chemical, physical and biological change in the quality of water that has harmful effect on any living thing.
4. Non point sources are the easiest to identify and control.
5. Water is affected by pollutants that come mainly from industries, farms, and sewerage systems.
6. Earth’s oceans are the most important oxygen sink on the planet along with rain forests.
7. Oceans: 17 % of earth surface is covered by oceans and seas and Glaciers: this covers approximately 2% of total water.
8. There are two types which hold ground water called a landfill. Confined aquifers. Unconfined aquifers.
9. They are called non point sources because they are direct sources of water pollution and can be reduced and monitored.
10. BOD is the amount of Oxygen required by micro-organisms to decompose the organic substance in sewage.

***Q2)*** ***Fill the blanks with suitable words****.***(30M)**1. Factories throw their waste in water bodies is one of the methods of -----------------------------------------.
2. --------- is a term that refers to all the methods by which people pollute their environment or surroundings.
3. Waste from power plants is one of the -------------------------------------------------------------- pollution.
4. --------------------------------------------- generator is used to break down pollutants in the water source.
5. Air is considered safe when it contains ------------------------------------------------------- dust and gases.
6. -------- pollutants derived from ------- pollutants due to chemical or photochemical action e.g. --------.
7. ---------------------- from combustion, industry, construction, mining, agriculture and warfare are increasingly significant in the environment pollution equation.
8. The amount of organic material that can rot in the sewage is measured by the --------------------------.

***Q3) Answer (4) four of the following questions briefly* (40M)**1. Compare between Point and Non point source pollution.
2. Write the sources, effects and sinks of the pollutants like (CO2, Hydrocarbons, CO and Oxides of Sulphur,)
3. Define pollutants, then compare between the primary and secondary pollutants.
4. What are the differences between combustion and absorption at the gaseous emission control?
5. Explain the major groups of land contamination briefly?
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