****

**Department of …Soil &Water**

**College of …Agriculture Engineering Science**

**University of …Salahaddin**

**Subject: … Soil Fertility and Fertilizers**

**Course Book – (*4th* Year)**

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

**Academic Year: 2022/2023**

**Course Book**

|  |  |
| --- | --- |
| **1. Course name** | Autumn  |
| **2. Lecturer in charge** | Dr. Ismaeel Tahir Ahmed |
| **3. Department/ College** | Soil & Water / Agriculture |
| **4. Contact** | e-mail : Ismaeel.ahmed @ su.edu.krdTel: ( 07504760935 ) |
| **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** |  |
| **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** |  |
| **10. Course overview:** * **Soil fertility and fertilizer are studied definition of fertility , history of fertility science in the world and the location of science to other soil and agriculture sciences ,**different between soil fertility and productivity, **division of nutrient ,the factors which are effecting on the availability of nutrients on** plant growth, The problems of macro elements ( N,P,K) availability on Calcareous soil, What are fertilizers( mineral , organic ,bio fertilizer ) definition of fertilizers Types of fertilizers , common types and the divisions with some special terminology, Methods of different fertilizers addition (advantages and disadvantages) ,Abbreviated industrialization of fertilizers and of efficiency fertilizers use , Evaluation of soil fertility status, Economics of fertilizer use.
 |
| **11. Course objective:**Collecting the suitable information for all fertility properties Protecting the green and safety environment and all the elements which have the relation with our soil and its specially its effects on the human life good or bad effect on plants . |
| **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- Quizes must be done weekly**.** |
| **13. Forms of teaching**1- Data show and power point.2- White board.3- Papers (Which collected some headline ) |
| **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 90 minutes.20 % of grade.
* **Final Exam:** The Final Exam is Comprehensive in all course outlines.

Mean of two examinations (Theoretical Part) - 15% Practical part - 35% = 50% Final examination: Theory = 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-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:**1. Das, D.K. (2003). Introductory Soil Science. Kalyani publishers, Ludhiana, New Delhi.NOI1 DA (U.P.).
2. FAO, (2006) Near East Fertilizer- use manual, Rome ,Italy**)**
3. Somani, L. L., and P. C. Kanthaliya (2004). Soils and fertilizers at a galance, Agrotech publishing academy. H. S. offset printers. New Delhi.
4. Tisdale, S. L., W. L. Nelson, J. D. Beaton, and J. L. Havlin. (1999). Soil fertility and fertilizer. 5**th** (Ed.) Simon and Schuster / Viacom Company.

▪ **Magazines and review (internet):** The core materials of the course consist 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. **Introductory of soil science, classifications, Pedology, Edaphology, soil fertility, the objective of soil fertility studying, factors affecting of soil fertility status.**
2. **Productivity – relations between soil fertility and productivity, factors affecting on soil productivity.**
3. **Factors affecting the nutrient availability or soil fertility, productivity, methods of soil fertility evaluation, growth expression and equation.**
4. **Plant nutrition, essential nutrient metabolism role of nutrients. Beneficial and other important nutrients, fertilizer application techniques and their impact on produce quality. Fertilizer application methods, traditional methods, application through modern irrigation system, consideration on fertility management.**
5. **Assessment of Fertilizer requirement, fertilizer application, calculation of Fertilizer needed Fertilizer solubility, Application through irrigation system (Fertigation)**
6. **Foliar fertilization, importance of Foliar fertilization ,Factors affecting the deficiency of Foliar fertilization , Effective of Foliar fertilization , Quality control measurements , Foliar fertilization as a remedy for nutrient deficiency Mineral fertilizers.**
7. **Nitrogen , Phosphate and potassium fertilizers and the problems of macro elements ( N,P,K) availability on Calcareous soils and the status Of micro nutrients**
8. **Methods of different fertilizers addition (advantages and disadvantages).**
9. **Abbreviated industrialization of fertilizers and of efficiency fertilizers use.**
10. **Evaluation of soil fertility status.**
11. **Economics of fertilizer use**
12. **The equations of productivity, advantage until nutrient balance.**
13. **What are nutrients, the divisions of nutrients, The available forms of nutrients.**
 | Dr. Ismaeel Tahir AhmedWeekly :- (2)hrs  |
| **18. Practical Topics (If there is any)** |  |
| **19. Examinations: *Example of Semester Examination:-***In regard to this subject the type of exam will be as follow: - A - Answer of the following questions : -1. List the methods of soil fertility evaluation.
2. What are the effects of (CaCO­3) on the availability of nitrogen and phosphorus on Kurdistan soils?
3. Nutrient availability in soil depend on organic matter content. How?
4. What's the (FAO)s standard of selecting fertilizer in the world?
5. List the factors affecting the absorption of nutrients by root of plant.
6. The points which are important when fertilizer operation will be done.
7. State the reasons behind followings:-
8. What are the problems of Nitrogen fertilizers in calcareous soils? Then explain the methods to eradicate or to reduce it?
9. Property of soil fertilizer is acquired or inherited characteristic. Why?
10. Compare between these terms or phrases below :-
11. Intensity of nutrient & Quantity of nutrient.
12. Liebige equation & Mitscherlich equation.

B - What is your concept for five of these following terms:  (Montmorillonite, Baule unit, Chelate, Foliar application, Luxury stage, Optimum yield, …… etc.**20. Extra notes:****21. peer review:** |