**Module (Course Syllabus) Catalogue**

**2023-2024**

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| **College/ Institute** | **Khabat Technical Institute** | |
| **Department** | **Medicinal Plant Production** | |
| **Module Name** | **Plant Nutrition** | |
| **Module Code** | **PN 205** | |
| **Semester** | **4** | |
| **Credits** | **6** | |
| **Module type** | **Prerequisite Core Assist.** | |
| **Weekly hours** | **4** |  |
| **Weekly hours (Theory)** | **( 1 )hr Class** | **( 2 )hr Workload** |
| **Weekly hours (Practical)** | **( 3 )hr Class** | **( 150 )hr Workload** |
| **Lecturer (Theory)** | **Karwan Talaat Mohammed** | |
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**Course Book**

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| **Course Description** | **Soil testing indicates the level of essential plants nutrients in the soil (predict nutrient availability) the plant itself is an indicator of the supply of nutrients available to it (plant nutrient uptake) there is a long history of plant and soil analysis that has determined the critical levels of nutrients needed for desired growth. With both a soil test and a plant tissue test, a complete diagnosis of the soil and plant production system can be made. The combine interpretation can lead to maximum profile by assessing production and fertility.** | | |
| **Course objectives** | **1- To studies the law of the nutrients absorption**  **2-To improve crop yield and improve product quality**  **3-What is the certain essential of macro and micro elements for the plant growth and nutrition?**  **4- How can we get a good product of plant by using the best method in cultivation** | | |
| **Student's obligation** | 1. Attendance of students in classes is necessary, as non-attendance has negative effect on student's perception. 2. Writing reports particularly in practical lessons as well as to scientific excursion. | | |
| **Required Learning Materials** | The lectures are presented in classes to students in different ways including data show, PowerPoint, manual papers and black and white boards. However, they are presented to student via lecturers' portal in university's website. | | |
| **Assessment scheme** | ‌16% Mid Term (Theory and practical)  4% Quiz  40% Assignment (report, paper, homework, seminar.)  25% final practical  15% final theory | | |
| **Specific learning outcome:** | **Studding soil fertility and fertilizers course both section theoretical and practical is extremely important especially in agriculture. As well as soil fertility and fertilizers was very important to increase the yield and production to plants. Also the study of soil fertility and fertilizer is important by teaching how to add fertilizer to soils. This refers to the ability of the soil to supply essential plant nutrients and soil water in adequate amounts and proportions for plant growth and reproduction in the absence of toxic substances which may inhibit plant growth** | | |
| **Course References‌:** | **1-Das, D.K. (2005). Introductionary soil science .alit printers, Maujpur.Delhi-53.**  **2-Tandon, HLS (1999) Methods of analysis of soils, waters, and fertilizers, New Delhi (India).**  **3.John, S. (2004). Nutrient Deficiencies and Application Injuries in Field Crops. Dept. of Agronomy. Iowa State University.**  **4.Niu, Y. F., Chai, R. S., Jin, G. L., Wang, H., Tang, C. X., Zhang, Y. S. (2012). Responses of root architecture development to low phosphorus availability , The Author Published by Oxford University Press on behalf of the Annals of Botany Company.**  **5.Pettigrew, W. T. (2008). Potassium influences on yield and quality production for maize, wheat, soybean, and cotton. Physiolgia Plantarum 133: 670-681.**  **6.Rich,C.I. (1972). Potassium in soil minerals. In proceeding of the 9yh Colloquium of the IPI. Landshut, Federal, Republic of Germany: 3-19.** | | |
| **Course topics (Theory)** | | **Week** | **Learning Outcome** |
| **The objectives of plant sampling** | | 1 |  |
| **The importance of plant nutrition** | | 2 |  |
| **Plant analysis** | | 3 |  |
| **Macro nutrient** | | 4 |  |
| **Micro nutrient** | | 5 |  |
| **Estimated the percentage of the total nitrogen in plant samples** | | 6 |  |
| **Scientific gurney** | | 7 |  |
| **Estimate the percentage of the total potassium in the plant samples** | | 8 |  |
| **Nutrient solution** | | 9 |  |
| **The media of plant nutrition** | | 10 |  |
| **Pot experiments and its conducting** | | 11 |  |
| **Field experiments and its application** | | 12 |  |
| **Practical Topics** | | **Week** | **Learning Outcome** |
| **How to make scientific assignment and presentation** | | 1 |  |
| **Introduction, course outline and main definitions** | | 2 |  |
| **An introduction to Plant Nutrition** | | 3 |  |
| **Classification of Plant Nutrition** | | 4 |  |
| **Soil minerals and distinguish** | | 5 |  |
| **Estimation of Soil Reaction (pH).** | | 6 |  |
| **Estimation of Active Forms of Carbonate in the plant.** | | 7 |  |
| **Estimation of total nitrogen** | | 8 |  |
| **Estimation of chloride** | | 9 |  |
| **Estimation of Calcium & Magnesium in the soil.** | | 10 |  |
| **Estimation of available Phosphorus in soil.** | | 11 |  |
| **Adsorption Isotherm for Phosphorus** | | 12 |  |
| **Questions Example**  **In regard to this subject the type of exam will be as follows: -**  **Qustion1/full the following sentences**  **1-variation in slop, -------------, ------------- should be taken into account.**  **Solution/1-textuer, color**  **Qustion2/Answer with true or falls then correct the falls.**  **1. Under intensive cultivation sampling should be done every three years**  **Solution/ 1-falls should be done every year.**  **What are the phosphorus symptoms deficiency?**  **How can we treat the potassium deficiency, what are the best fertilizer to be add to our soils and why?** | | | |
| **Extra notes:** | | | |
| **External Evaluator**  This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.  *(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).*  ئه‌م كۆرس بوكه‌ پیداجونه‌وةى بۆكرا گونجاوه‌ بۆ قۆناغی دووه‌م به‌شی بةرهةمى رووةكى پزیشکی په‌یمانگای ته‌كنیكی خه‌بات  Dr. Dawd rasool kia | | | |