Code	Subject Title	Cr. Hrs	Semester
BOT-406	**Plant Nutrition and Soil Fertility (Lab.)**	**1**	**VII**
Year	Discipline		
4	**BOTANY**		

Syllabus Outline: Study of different media for plant growth, macro and micronutrients, determination of total water requirements.

Course Outline:

1. Sand and Water Culture Methods.
2. Study of Deficiency Symptoms of Macro and Micronutrient Elements.
3. Phenotypic Adaptations of plants to Nutrients, Deficiency and Methods of Growth Analysis.
4. Plant Tissue Analysis for Principle Inorganic Ions.
5. Determination of P, Ca and Mg Content of Soil.
6. Preparation of Fertilizer Mixtures.
7. Determination of total Water Requirements of a Crop by using Climatic Data (Blaney and Criddle Formula will be used).
8. Preparation of Standard Acid, Alkali and Indicator Solutions.

Module Aims: This Laboratory Course will help students to solve problems related to Soil Fertility and Fertilizers. Students will learn about various techniques of growing plants.

Learning Strategies:

1. Lectures
2. Group Discussion
3. Laboratory Work
4. Seminar/ Workshop

Learning Outcome: Experiments based on Theory Syllabus will be explored. Students will be able to grow plants in different media. Students will be able to observe different symptoms due to deficiency of various nutrients in the media

Assessment Strategies:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class Discussion
4. Quiz
5. Tests

Books Recommended:

1. **Taiz, L.D. and Zeiger, E. (2010).** *Plant Physiology*. (5th Ed.), Sierauer Associates.

2. **Barker, A.V. and Pilbeam, D.J. (2007).** *Hand Book of Plant Nutrition.* CRC Press Washington D.C.

3. **Epstein, E. and Bloom, J.A. (2005)** *Mineral Nutrition of Plants: Principles and Perspectives*. (2nd Ed.), Sierauer Associates.

4. **Tisdale, S. and Nelson, W. (2005).** *Soil Fertility and Fertilizers*. (3rd Ed.), McMillans.

5. **Wallace, T. (2005).** *The Diagnosis of Mineral Deficiencies in Plants*. Her Majesty's Stationery Office, London.

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