

- a. **Course Code:** PBT-811
- b. **Title:** Plant Stress Physiology
- c. **Credit Hours:** 3(3-0)
- d. **Learning Objectives**

This course aims to provide detail insight of stress tolerance mechanism adapted by plants.

- e. **Outcomes**

The students will gain knowledge of adverse effects of major types of abiotic stresses on plant molecular metabolism and on other physiological processes that control growth, development and productivity of plants, enables the students to assess losses in crop yield that can be attributed to stress. Moreover, the students have the ability to analyze the molecular mechanisms of stress resistance which plants have developed to cope with harsh conditions.

- f. **Contents**

- Plant Stress Response-Physiological and molecular perspectives
- Major types of abiotic stress and molecular interactions with the physiological responses of plants
- Molecular mechanisms of stress resistance of photosynthetic machinery induced by
 - Drought
 - Temperature extremes
 - Consequences and Strategies for Protecting Photosynthetic Machinery
- Physiological and molecular adaptations to Heavy metal Toxicity
- Plant Physiological and molecular responses to salt stress
 - Salt stress molecular sensors
 - Salt-Induced Organellar Stresses
 - Cell wall stress
 - Chloroplast stress
 - Endoplasmic Reticulum (ER) Stress

- Mitochondrial stress
- Molecular Perspectives in Salinity tolerance in Halophytes
 - Salt Cress as Model Halophytic Organisms
- Carbohydrate and Amino Acid Molecular Dynamics in plants during stress perspectives
- Influence of Plant Pathogens on Host Molecular Stress Physiology
 - Herbivory and Plant Stress.
 - Allelochemical as a Plant Stress

g. Details of lab work (if applicable)

Not applicable

g. Recommended Readings

- Plant Stress Physiology, Sergey Shabala, 2nd Edition, Wallingford, Oxfordshire, UK ; Boston, MA, USA : CABI, 2017.
- Molecular Stress Physiology of Plants, Springer 2013
<https://doi.org/10.1007/978-81-322-0807-5>
- Plant Abiotic Stress Tolerance, Springer Cham, 2019,
<https://doi.org/10.1007/978-3-030-06118-0>