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| **FORMAN CHRISTIAN COLLEGE**  |  | **CREDITS (3)** |
| BIOL 403 **SPRING 2023**PLANT PHYSIOLOGY (Sec. A) |  | Instructor: **Dr.Aisha Saleem Khan** Lecture: Tues/Thurs (12:30-1:45) S-329E-Mail: asihasaleemkhan@fccollege.edu.pkOffice: 118 S-BlockOffice Hours: [MWF 12:00-1:00] |
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| **Overview** This course deals with the functions of different plant organs in relation to their shape and structure i.e., why some leaves appear green, yellow and some may even red and purple etc.? It has something to do with photosynthesis? What is the significance for different color of flowers? How water, sucrose and minerals travel within plant body? How do plants photosynthesize and respire? What are different cellular and molecular basis of plant growth hormones and why they are commercially important? How do plants cope with stress? This course will answer such questions and also add student’s knowledge of fundamental process taking in plants upon which our lives depend.**Objectives**: Major objectives of this course are:* To give a thorough understanding of fundamental process of life supporting the planet earth i.e., photosynthesis and respiration
* To give a comprehensive and advanced knowledge of plant growth, mechanism of water uptake and role of essential nutrients in plant metabolism
* To enable the students to assess the effects of various environmental factors on plant growth and development
* To enhance and update students’ knowledge through journals and links of Plant Physiology
* Will develop habit of critical thinking and justify their thoughts logically

**Learning Outcomes**: After the completion of this course, students will be able to* Can relate the shape of plant organs in relation to their structure and function
* Will be able to understand the means of communication within a plant body
* Will have a clear understanding of role and interactions of plants with their environment
* Will be able to explain how plants sustain their lives and why?
* Will have knowledge of different pigment in plant body responsible for giving green to leaves and beautiful colors to flowers
* Will develop aptitude towards plants sciences

**Grading Policy:** Quizzes (10%), Class activities (10) Semester Assignment (25%) Mid-Term (25%) and Final Exam (30%).**Projects:**Students will prepare projects on the Topics Given and this activity will constitute 25% of the Total Grade.**Books**: Plant Physiology Taiz and Zeiger by 3rd Edition Botany, An introduction to Plant Biology by Mauseth 3rd Edition **Teaching Methodology**: White boards, multimedia, online videos and class rooms discussion will be part of teaching methodology. Important videos and information will also be shared through moodle  |  | **Materials (Week wise) 1st**. Introduction, Plant Primary and Secondary Organization, Plasmodesmata and their role **2nd**. Water Transport through the Xylem, Apoplast and Symplast Pathways  **3rd**. The Physiology and Molecular Basis of Sucrose Pathway in Phloem, Mass Flow Hypothesis (**Quiz1**)**4th**. Plant Water Relationships  **5th.** Photosynthesis: Light Reactions, Light Harvesting Complex/ Thylakoid Membrane, ATPase synthetase **6th**. Stroma Reactions/ Calvin Cycle, C4  **7th**. CAM Pathways,**8th**. Respiration: Thermodynamics of Glycolysis **MIDTERM EXAM****9th**. Plant Growth Hormones: IAA Transport and Signal Transduction in *Arabidopsis thaliana*, Effects on Cell wall Loosening and Commercial Applications **10th**. Gibberellins: Synthesis, Role and Metabolism (**Quiz 2)** **11th**. Transgenic Plants: Applications in Agriculture, Medicines, And Industry **12th**.MEP and DOXP Pathways (**Quiz3**)**13th , 14th** . Projects Presentations **15th**. **FINAL EXAM** |