PLANT BIOLOGY (PBIO)

PBIO*3110 Crop Physiology Winter Only (LEC: 3, LAB: 3) [0.50]
This course examines the physiological basis of crop yield determination, with emphasis on phenomena that express themselves at the whole canopy (rather than single plant) level of organization. It covers canopy scale measurements of crop growth, development, and solar radiation capture; photosynthesis, beginning at the level of biochemistry and working up to the whole canopy scale; how photoassimilates are used in the processes of respiration, growth and yield formation; and crop - environment interactions, including water stress, nutrient uptake and utilization, and light quality effects on photomorphogenesis.
Prerequisite(s): 1 of BIOL*1050, BIOL*1070, BIOL*1090
Department(s): Department of Plant Agriculture
Location(s): Guelph

PBIO*3120 Plant Physiology Winter Only (LEC: 3, LAB: 2) [0.50]
This course examines the anatomical, physiological and biochemical traits that have evolved in plants emphasizing the mechanisms of energy capture, nutrient concentration, compartmentalization and signal transduction that allow plants to dominate the landscape. Using examples from crop and horticultural plants the course will emphasize how evolutionary adaptations and life strategies of plants are utilized in managed systems to optimize the usefulness of plants to humans in field and controlled environment production systems. Case studies and labs will emphasize skills needed to measure physiological responses and problem solve. [First Offering - Winter 2023]
Prerequisite(s): BIOL*1050 or BOT*2100
Department(s): Department of Plant Agriculture
Location(s): Guelph

PBIO*3750 Plant Tissue Culture Fall Only (LEC: 2, LAB: 3) [0.50]
This course examines and discusses the principles, protocols and utilization of plant cell tissue culture systems. In vitro propagation and regeneration, mutagenesis and selection, secondary metabolite elicitation and cell transformation techniques including protoplast fusion, direct DNA uptake and plant bacterial co-cultivation will be emphasized.
Prerequisite(s): AGR*2470 or BOT*2100
Department(s): Department of Plant Agriculture
Location(s): Guelph

PBIO*4000 Molecular and Cellular Aspects of Plant-Microbe Interactions Fall Only (LEC: 3) [0.50]
This course examines molecular and cellular aspects of the interaction between plants and microorganisms such as mycorrhizae, pathogenic fungi, Agrobacterium, pathogenic bacteria, and plant viruses. Topics include microbial virulence, signaling, gene expression, and disease resistance in plants.
Prerequisite(s): 1 of BOT*2100, MICR*2030, (BIOL*1070, BIOL*1090, MBG*2040)
Department(s): School of Environmental Sciences
Location(s): Guelph

PBIO*4070 Biological and Cultural Control of Plant Diseases Winter Only (LEC: 3) [0.50]
This course explores current concepts and approaches to managing plant pathogens and diseases in crops and natural plant communities by measures that have minimal impact on the environment. Topics include naturally-occurring biological control such as suppressive soils and induced host resistance, use of microbial agents and their modes of action, transgenic disease resistance, use of organic soil amendments and mulches to promote microbial diversity and suppress pathogens, and effects of sanitation, crop sequences, tillage, flooding, soil solarization and other cultural practices on microbial communities, including pathogens and on disease epidemics.
Prerequisite(s): 1 of ENVB*3210, ENVS*3210, MICR*3090, MICR*3220
Equate(s): ENVB*4070
Department(s): Department of Plant Agriculture
Location(s): Guelph

PBIO*4150 Molecular and Cellular Aspects of Plant Development Winter Only (LEC: 3) [0.50]
This course examines the molecular and cellular processes that underlie cellular differentiation and organ formation in plants. The roles of homeotic genes, gene regulation, cell polarity, morphogens and environmental effects in development will be discussed. Subjects will be introduced by a lecture and examined in detail in discussions of pertinent research papers.
Offering(s): Offered in even-numbered years.
Prerequisite(s): (AGR*2470 or BOT*2100), (MBG*2040 or MBG*2400)
Department(s): Department of Plant Agriculture
Location(s): Guelph

PBIO*4290 Cannabis Production Winter Only (LEC: 3) [0.50]
This course covers the essential biology and biochemistry of cannabis (Cannabis sativa), as well as the science and technologies of propagation, cultural management and production, postharvest storage and processing of the plant, and the potential environmental impacts and related remediation technologies. It will also discuss the history of cultivation and uses of the plant, and current legislation of cannabis production and consumption in different cultures/countries. Students will learn through lectures (including guest lectures), hands-on laboratory practices, site visits, literature research and presentations, and group discussions.
Prerequisite(s): 14.50 credits including CHEM*1040, ENVS*3300, (ENVS*2040 or ENVS*3210)
Department(s): Department of Plant Agriculture
Location(s): Guelph

PBIO*4530 Plants and Environmental Pollution Winter Only (LEC: 3) [0.50]
This course analyzes the environmental pollution effects on physiological and ecological processes of plants, in both managed and unmanaged ecosystems. Pollutants under study include contaminants of air (such as ozone, sulphur dioxide, NOx) and soil (such as metals). This course also covers how to use plants to improve air (both indoor and outdoor), water and soil environment. The format includes both lecture and presentation/ discussion of current and historical peer-reviewed literature.
Prerequisite(s): (1 of BIOL*2060, BOT*2100, ENVM*1200, ENVS*2040 , ENVS*2330, PBIO*3110), CHEM*1040
Department(s): School of Environmental Sciences
Location(s): Guelph

PBIO*4750 Genetic Engineering of Plants Winter Only (LEC: 3, LAB: 3) [0.50]
This course provides an examination and discussion of the principles, protocols and applications of molecular biology and transformation technology to the genetic improvements of plants.
Prerequisite(s): (AGR*2470 or BOT*2100), (MBG*2040 or MBG*2400)
Department(s): Department of Plant Agriculture
Location(s): Guelph