

PLANT AGRICULTURE (PLNT)

PLNT*6010 Physiology of Crop Yield Winter Only [0.50]

This course covers factors affecting biomass production and yield, with primary focus on phenomena measured at the whole canopy scale. Yield-limiting abiotic stresses (temperature, water deficit, nutrient deficiency) are considered in detail, as are technical aspects of instrumentation used in crop physiology research.

Offering(s): Annually

Prerequisite(s): P BIO*3110

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6040 Foundations in Plant Agriculture Fall Only [0.50]

This course presents the diversity of plant agriculture through case studies and discussion topics that familiarize students with the breadth and depth of plant agriculture. The course emphasizes skills to find resources, collaborate and communicate within plant agriculture.

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6063 Integrated Plant Preservation Systems Winter Only [0.50]

This course explores integrated plant preservation systems, emphasizing the use of advanced technologies such as cryopreservation, micropropagation, controlled environment agriculture, and artificial intelligence for energy-efficient commercial crop cultivation. Students investigate current innovations in plant growth regulation, stress resilience, and climate adaptation, with a strong focus on biodiversity conservation. Broader themes include sustainable food systems, global health, and planetary well-being from both scientific and ethical perspectives.

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6080 Plant Disease Epidemiology and Management Fall Only [0.50]

This course focuses on the epidemiology and management of plant diseases including infection cycles, host-pathogen interactions and disease progress curves, and how the science informs disease management strategies. Students will explore the scientific literature and participate in presentations and discussions.

Offering(s): Even-numbered years

Prerequisite(s): ENVS*3210 or P BIO*4070

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6100 Advanced Plant Breeding I Winter Only [0.50]

The practical consideration of genetic theory and biological limitations to improving plant populations and developing cultivars are discussed. Current and emerging breeding methodologies and sources of variation used to achieve plant breeding goals are examined through lectures, paper discussion, site visits and invited talks.

Offering(s): Annually

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6140 Biological and Cultural Control of Plant Diseases Winter Only [0.50]

This course explores current concepts and approaches to managing pathogens and diseases in detail but other methods (e.g. genetic resistance) will be presented as well. Offered in conjunction with P BIO*4070. Extra work is required of graduate students.

Offering(s): Annually

Restriction(s): Credit may be obtained for only one of P BIO*4070 or PLNT*6140

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6160 Advanced Plant Breeding II Winter Only [0.50]

Fundamentals of quantitative genetics. Topics include gene and genotype frequencies means, variances, covariances and resemblance among relatives. Lecture topics are expanded through discussion of classic and current papers.

Offering(s): Odd-numbered years

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6210 Herbicide Physiology and Biochemistry Fall Only [0.50]

This course provides a comprehensive study of the major herbicide groups. The various herbicide groups are discussed under the following topics: herbicide uptake and translocation, herbicide mode of action, herbicide selectivity, weeds controlled and crop injury.

Offering(s): Odd-numbered years

Department(s): Department of Plant Agriculture

Location(s): Guelph, Ridgetown Campus

PLNT*6230 Colloquium in Plant Physiology and Biochemistry Unspecified [0.25]

An open discussion course designed to review and critically analyze contemporary issues in plant physiology and biochemistry.

Offering(s): Annually

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6240 Colloquium in Crop Production and Management Unspecified [0.25]

An open discussion course designed to review and critically analyze contemporary issues in crop production and management.

Offering(s): Annually

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6250 Colloquium in Plant Genetics and Breeding Unspecified [0.25]

An open discussion course designed to review and critically analyse contemporary issues in plant genetics and breeding.

Offering(s): Annually

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6260 Advanced Plant Genetics I Fall Only [0.50]

A lecture and discussion course examining the underlying principles of genetics and the recent advances in plant genetics. Topics include: structure of the genome, experiments to measure and experimentally describe phenotypes, population structures, and molecular basis of inheritance of a phenotype.

Offering(s): Odd-numbered years

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6290 Advanced Plant Molecular Genetics Fall Only [0.50]

A lecture and discussion course examining the molecular genetic basis and regulation of physiological, stress tolerance and developmental processes in higher plants including crops. Students are strongly encouraged to have completed advanced undergraduate coursework in eukaryotic molecular genetics. Offered in conjunction with MBG*4300. Extra work is required of graduate students.

Offering(s): Odd-numbered years

Restriction(s): Credit may be obtained for only one of PLNT*6290 or MBG*4300.

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6320 Metabolic Processes in Crop Plants Fall Only [0.50]

A comprehensive examination of the metabolic mechanisms and versatility whereby autotrophic organisms sustain themselves. Emphasis is placed on our current understanding of the regulation and integration of metabolic processes in plants and their physiological and agricultural significance including available research methodologies. Students should have an undergraduate course in biochemistry prior to registering in the course.

Offering(s): Annually

Prerequisite(s): BIOC*2580

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6340 Plant Breeding Fall Only [0.50]

This course examines principles of plant breeding in self- and cross-pollinated crops. Additional topics include crop domestication, mating systems, heritability, gain from selection, disease resistance, polyploidy, marker assisted selection and government regulations. Offered in conjunction with MBG*4160. Extra work is required of graduate students.

Offering(s): Annually

Restriction(s): Credit may be obtained for only one of MBG*4160 or PLNT*6340

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6350 Digital Agriculture Fall Only [0.50]

This course presents concepts and techniques used to collect, process, analyze, and present remotely sensed data for plant agriculture applications. Students learn botanical characteristics of vegetation and their influence on remote sensing while gaining hands-on experience for applications in field crops and specialty crops, such as how remote sensing relates to and augments other precision agriculture technologies such as yield monitoring, yield prediction, stress detection, soil mapping, global positioning systems (GPS), and Geographic Information Systems. Students complete this course with an understanding of how remotely sensed data complements and enhances other data sources as part of information processing chains for crop management and plant phenotyping. This course is offered in conjunction with AGR*4020. Extra work is required for graduate students.

Restriction(s): Credit may be obtained for only one of AGR*4020 or PLNT*6350.

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6400 Seminar Fall and Winter [0.25]

All graduate students present a departmental seminar on their research proposal in their second or third semester. Each student is expected to participate in the seminars of colleagues and faculty.

Offering(s): Annually

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6440 Solutions for Plant Agriculture Summer Only [0.50]

This course surveys the agricultural operations in Ontario and focusses on site visits to both farms and research stations. Students create and plan implementation of innovative solutions to problems facing plant agriculture using science driven solutions. The course emphasizes application of knowledge and skills learned throughout the first two semesters of the program. The course includes six hours of field trips every two weeks.

Restriction(s): Restricted to Master of Plant Agriculture students.

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6450 Plant Agriculture International Field Tour Fall Only [0.25]

A field course designed to increase student's knowledge of primary field and animal agricultural production systems, to explore the environmental and political issues related to international agriculture, and to understand the role of agri-business in the rural economy.

Offering(s): Annually

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6500 Applied Bioinformatics Fall Only [0.50]

This course covers current methods for making use of large molecular data sets to identify the genes that control traits, to characterize genes' functions, and to infer genetic relationships among individuals. It focuses on case studies and current research in agriculture, environmental biology, and medicine to introduce molecular data analysis methods, including analyzing genome sequences, constructing nucleotide alignments, constructing phylogenies, and finding motifs and genes in biological sequences. Lab sessions include an introduction to Unix and Python/R for the biologist and hands-on use of several molecular data analysis problems. Offered in conjunction with BIOL*3300. Distinct work is required of graduate students.

Offering(s): Annually

Prerequisite(s): MBG*2040 and STAT*2040 or STAT*2230

Restriction(s): Credit may be obtained for only one of BIOL*3300 or PLNT*6500

Department(s): Department of Plant Agriculture

Location(s): Guelph

PLNT*6510 Plant Tissue Culture Fall Only [0.50]

This course examines and discusses the principles, protocols and utilization of plant cell tissue culture systems. In vitro propagation and regeneration, somatic embryogenesis, in vitro mutagenesis and selection, secondary metabolite elicitation and cell transformation techniques including protoplast fusion, direct DNA uptake and plant bacterial co-cultivation will be emphasized. Offered in conjunction with PBIO*3750. Extra work is required for graduate students.

Restriction(s): Credit may be obtained for only one of PBIO*3750 or PLNT*6510. Restricted to MPAg, MSAg, and MSc and PhD in Plant Agriculture students.

Department(s): Plant Agriculture

Location(s): Guelph

PLNT*6520 Applied Computational Biology in Agricultural Science Winter Only [0.50]

This course examines the role of computational biology in advancing agricultural practices and crop improvement. Students explore various multiomics analyses such as genomics, phenomics, artificial intelligence, data integration techniques, and computational tools essential for modern agriculture. Through both theoretical and practical approaches, the course prepares students to tackle modern agricultural challenges using computational biology methods.

Department(s): Plant Agriculture

Location(s): Guelph

PLNT*6530 Reproducible Data Science for Agriculture Winter Only [0.50]

The principles and practices of open data science are introduced, with emphasis on reproducibility, tidy coding, and open source science workflows. Techniques for managing, visualizing, and analyzing agricultural data are explored through examples relevant to crop and soil sciences. Statistical modeling approaches commonly used in agronomic research are presented, alongside tools for effective data organization and communication. Students are expected to already have some computing literacy.

Co-requisite(s): UNIV*6020 or STAT*6950

Department(s): Plant Agriculture

Location(s): Guelph

PLNT*6800 Special Topics in Plant Science Unspecified [0.50]

A study of selected contemporary topics in plant science. Proposed course descriptions are considered by the Department of Plant Agriculture on an ad hoc basis, and the course is offered according to demand.

Department(s): Department of Plant Agriculture

Location(s): Guelph