PLANT SCIENCE (PLNT)

PLNT 0410 Crop Production Principles and Practices 4 cr
(Lab required) This course provides a broad understanding of the principles and practices of crop production. The importance of crop production for western Canada and for worldwide food production. Constraints, challenges and opportunities will be explored. The course will cover crop plant biology and provide an introduction to agronomic management practices for Manitoba crop production. Topics will include crop rotation, cultivar selection, tillage, seeding, fertilizer, pest control, precision agriculture and bio security.

PLNT 0750 Forage and Pasture Management 4 cr
(Lab required) This course covers for forage crops and the continuum of improved and unimproved pasture land a discussion of production practices including: choice of species and cultivars of forage crops, cultural management including tillage practices, pest control, forage harvesting, grazing management and seed production.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 0410 or the former DAGR 0420.

PLNT 0770 Weed Management 4 cr
General principles of weed management and pesticide use safety as they relate to weed control. Topics will include weed biology and identification, economic importance, principles of chemical, cultural, mechanical and biological weed management, introduction to herbicides including modes of action and factors influencing their use, selectivity, risks for development of herbicide-resistant weeds and how to mitigate this risk.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 0410 or the former DAGR 0420.

PLNT 0780 Plant Disease Management 4 cr
(Lab required) General principles of pest management and pesticide use safety as they relate to plant disease control. Discussion of diseases attacking field and horticultural crops in the Prairies including disease symptoms, cycles, prevention and control. May not be held with PLNT 4270.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 0410 or the former DAGR 0420 (D).
Mutually Exclusive: PLNT 4270

PLNT 0810 Special Topics in Crop Management 3 cr
Selected topics of current interest in Crop Management.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: written consent of the Director of the School of Agriculture.

PLNT 0820 Organic Crop Production on the Prairies 3 cr
Management principles and practices involved in the production of organic field and forage crops with a focus on the Canadian Prairie region. May not be held with PLNT 3560.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: [PLNT 0410 and SOIL 0420] or [the former DAGR 0420 (D)].
Mutually Exclusive: PLNT 3560

PLNT 1000 Urban Agriculture 3 cr
Urban environments and their importance for food production, increasing biodiversity, and reducing pollution are presented. Topics include principles of vegetable, fruit and herb production, landscape plants, and utilization of natural systems for composting, water management and reduced pesticide use. Benefits to environment, community development, and human health are discussed.
Attributes: Recommended Intro Courses

PLNT 2500 Crop Production 3 cr
(Lab required) An introduction to the principles and practices of crop production in Canada. Topics will include physiological processes and factors affecting plant yield, plant improvement, seed production, and production of the major cereal, oilseed, forage and special crops.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: AGRI 1600 (or the former AGRI 1500) (D).

PLNT 2510 Fundamentals of Horticulture 3 cr
(Lab required) Principles of the culture, marketing, and utilization of fruits, vegetables, and ornamentals, their contribution to the economy and well-being of consumers, and impact of horticultural activities on the environment.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: BIOL 1030 (D) and [AGRI 1600 (or the former AGRI 1500) (D) or PLNT 1000 (D)] or consent of instructor.

PLNT 2520 Genetics 3 cr
Basic principles of genetics and their practical application in the areas of DNA structure and function, genome organization and genetic analysis. Laboratory sessions provide practical experience in solving genetic problems and conducting genetic investigations. Not to be held with BIOL 2500 or the former BOTN 2460.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: BIOL 1020 and BIOL 1030.
Equiv To: BIOL 2500, BOTN 2460, BOTN 2461

PLNT 2530 Plant Biotechnology 3 cr
(Lab required) An introduction to current biotechnological techniques, including recombinant DNA, plant tissue culture, plant transformation and regeneration. A background to the techniques as well as a discussion of their applications in current biology and crop production will be examined. A laboratory will provide first hand experience with many of the techniques.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: [(CHEM/MBIO 2730 and CHEM 2740) or the former CHEM/MBIO 2770; or (CHEM/MBIO 2700 (CHEM/MBIO 2701) and CHEM 2720 (CHEM 2721)) or the former CHEM/MBIO 2360 (the former CHEM/MBIO 2361)] and [PLNT 2520 or BIOL 2500].

PLNT 3140 Introductory Cytogenetics 3 cr
An introduction to the structure and function of eukaryotic genomes, from the gene to the chromosome. Topics include the cell cycle, meiosis, chromatin, chromosome and genome organization, karyotyping, changes in chromosome number and structure, physical mapping and chromosome evolution. Labs cover use of the microscope, meiosis, chromosome staining and banding, and bioinformatic analysis of chromosomes.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: PLNT 2520 or BIOL 2500 or the former BOTN 2460.

PLNT 3400 Plant Physiology 3 cr
(Lab required) An integrative view of major physiological processes in plants, spanning the biochemical, cellular, tissue, organ and whole plant levels of organization. The focus will be on photosynthesis, respiration, plant water relations, plant mineral nutrition, and the role of hormonal and extrinsic factors in the regulation of plant growth. Also offered as BIOL 3400. May not be held with BIOL 3400, the former BIOL 3450 or the former PLNT 3500.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: BIOL 2242 and [(CHEM/MBIO 2730 and CHEM/MBIO 2740) or the former CHEM/MBIO 2770; or (CHEM/MBIO 2700 (CHEM/MBIO 2701) and CHEM/MBIO 2720 (CHEM 2721)) or the former CHEM/MBIO 2360 (the former CHEM/MBIO 2361)]; or consent of the instructor.
Equiv To: BIOL 3400
Mutually Exclusive: BIOL 3450, BOTN 2020, PLNT 3500

PLNT 3520 Principles of Plant Improvement 3 cr
Basic objectives, principles, and methods of plant genetic improvement. Traditional and modern plant breeding, genetic resources, selection, and applications of tissue culture, genetic engineering and molecular markers to plant improvement.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 2520 or BIOL 2500 or the former BOTN 2460.

PLNT 3540 Weed Science 3 cr
(Lab required) Identification, biology and ecology of weeds of agricultural importance in western Canada, including principles of cultural, mechanical, biological and chemical control. Topics include weed interference, effects of rotational and management practices on weed species composition, herbicide selectivity and mechanism of action, and emerging control technologies.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: BIOL 1030 (D) and [AGRI 1600 (D) or the former AGRI 1500 (D)] or consent of instructor.

PLNT 3560 Organic Crop Production on the Prairies 3 cr
Management principles and practices involved in the production of organic field and forage crops with a focus on the Canadian Prairie region. May not be held with PLNT 0820.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: PLNT 2500 (D) and SOIL 3600 (D) or consent of instructor.
Mutually Exclusive: PLNT 0820

PLNT 3570 Fundamentals of Plant Pathology 3 cr
(Lab required) An introduction to the science of plant pathology. Topics include causal agents of diseases, symptoms and diagnoses, modes of infections and spread, mechanisms in disease and control, effects of the environment on disease development, and methods of disease control. This course is a prerequisite for more advanced courses in plant pathology.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: BIOL 1030 (D).

PLNT 4270 Plant Disease Control 3 cr
(Lab required) Diseases attacking field crops and horticultural plants: recognition of symptoms, methods of prevention, alleviation, and control. May not be held with PLNT 0780.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 2500 (D) or consent of instructor.
Mutually Exclusive: PLNT 0780

PLNT 4310 Introductory Plant Genomics 3 cr
An introduction to basic technologies in plant genomics. Topics include DNA sequencing, molecular marker detection, genome sequencing, gene expression analysis, gene mapping and functional analysis. A laboratory will provide hands- on experience with several genomic techniques. Not to be held with the former PLNT 4540.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: PLNT 2520 OR BIOL 2500 or the former BOTN 2460 or consent of instructor.
Equiv To: PLNT 4540

PLNT 4330 Intermediate Plant Genetics 3 cr
A study of gene behaviour as related to genetic analyses of data from plant populations; multiple allelic systems and polygenic inheritance of quantitative traits; extra-chromosomal inheritance and the significance of cytoplasmic influence. Examples will be drawn from experimental data where available.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 2520 or BIOL 2500 or the former BOTN 2460.

PLNT 4380 Plant Science Thesis 6 cr
An independent research project under the supervision of a staff member. A thesis including a literature review, methods, results and discussion is required. Enrollment limited. Open only to students in their 4th year. Not to be held with SOIL 4080.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: Consent of department head.

PLNT 4410 Grassland Agriculture: Plant, Animal and Environment 3 cr
Inter-relationships between the biological components of grassland agriculture as they relate to forage production on the Canadian Prairies. Topics include utilization by wild and domestic animals, plant community relationships and role of forages in multiple land use planning. This course also offered in Animal Science as ANSC 4410.
Equiv To: ANSC 4410

PLNT 4510 Advanced Cropping Systems 3 cr
Examination and analysis of sustainable Prairie cropping systems. Emphasis will be placed on systems that optimize the benefits of crop rotation, integrate crops and livestock, conserve soil and water resources, and enhance biodiversity. Current, historical, and emerging crop production systems from the Prairies and other regions of the world will be discussed. Includes experiential learning through farm interviews and/or field tours and/or guest speakers. May not be held with PLNT 3510.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 2500 (D).
Mutually Exclusive: PLNT 3510

PLNT 4550 Developmental Plant Biology 3 cr
An introduction to mechanisms regulating morphogenesis and plant growth and development. Emphasis will be on experimental approaches used to investigate pattern formation at sub cellular, cellular, tissue and organ levels. A heavy tissue culture component in the lab will implement the lecture topics and will provide new insights into ways to study plant development in vitro.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 3400 or BIOL 3400 or the former PLNT 3500.

PLNT 4570 Research Methods in Plant Pathology 3 cr
Course will provide practical training in plant pathology and will cover plant disease diagnosis, pathogen isolation, identification, inoculation, and storage. Molecular techniques currently used in the study of plant pathogens will be covered. The laboratory component aims at preparing students for a professional career in plant protection and research in plant pathology.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 3570 or consent of instructor.

PLNT 4580 Molecular Plant-Microbe Interactions 3 cr
Course will cover general principles and mechanisms related to plant-pathogen interactions, such as in gene-to-gene and toxin models. Emphasis will be on biochemical/molecular mechanisms of plant-microbe recognition, pathogenesis, and plant reactions to infections. Both beneficial and deleterious associations will be covered. This course is offered in alternate years.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: PLNT 3570.

PLNT 4590 Physiology of Crop Plants 3 cr
(Lab required) Concepts dealing with the physiological response of crop plants to the environment from the time of seed germination through to reproduction.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisite: BIOL 2242 (D) or consent of instructor.

PLNT 4610 Bioinformatics 3 cr
An introduction to the theory, strategies, and practice of data management and analysis in molecular biology. Topics include DNA and protein sequence analysis, biological databases, genomic mapping, and analysis of gene expression data. The course will include problem-solving exercises using Unix server-based software.
PR/CR: A minimum grade of C is required unless otherwise indicated.
Prerequisites: PLNT 2530 or PLNT 3140 or MBIO 3410 or PLNT 4310 or the former PLNT 4540 or consent of instructor.
Equiv To: PLNT 7690