

# PSPP - Plant Sciences/ Plant Pathology

## **PSPP 501 Navigating Graduate Studies: 3 Credits (3 Lec)**

(F) This course is designed for early career Masters and PhD students in the agricultural, environmental, and biological sciences. The course helps students navigate practical aspects of graduate school, identify and achieve their professional goals, and develop and articulate their research through writing.

## **PSPP 516 Research Design and Analysis: 3 Credits (3 Lec)**

PREREQUISITE: STAT 401. (F) Data analysis and interpretation of problems unique to agricultural and biological research. Topics include: sample size determination, assumptions and transformation of data scale, completely random, randomized block, Latin Square, and split-plot designs, comparisons among means, factorial experiments, use of the statistical programming language R, and data visualization. This course may not be appropriate for students who have completed STAT 511 and 512

## **PSPP 521 Plant Science for Teachers: It Grows on You: 1 Credits (1 Lec)**

(Su) In this course you will learn about the characteristics of plants, how abiotic factors influence plant growth and development, and experimental design and data collection methods. You will be challenged to create innovative lessons to deliver this content in your particular classroom setting. Offered Summer.

## **PSPP 522 Insect-ology for Teachers: 3 Credits (3 Lec)**

(Su) This exciting course is designed for elementary, middle school and high school teachers. The course provides an effective way to integrate instructional scientific strategies for teachers. Students will share cross-level instruction and constructive ideas. The goal of this course is to promote the study of insects and applications of insects. This eight-week course is intended for teachers enrolled in the Masters of Science in Science Education degree program, the NTEN Certificate Program, and other teachers with a minimum of two years teaching experience seeking professional development. Offered Summer.

## **PSPP 524 Adv Plant Pathology: 3 Credits (3 Lec)**

(F) Offered every other Fall, odd numbered years. This course is designed to give graduate students in the Department of Plant Sciences Plant Pathology or other departments a broad survey of plant pathology subject matter at the graduate level and to give all graduate students in PSPP a common experience and introduction to PSPP graduate faculty. This course will serve as a companion to Genetic Plant Improvement (PSPP 542) taught in Spring odd alternate years by the plant breeding faculty.

## **PSPP 530 Crop Physiology: 3 Credits (3 Lec)**

PREREQUISITE: BIOO 433; CHMY 211. This online offering examines interactions between plants and the environment. Light, environment, plant canopy development, photosynthesis, source-sink relations, growth analysis, growth regulation, water relations, and environmental stresses are addressed

## **PSPP 541 Advanced Eukaryotic Genetics: 3 Credits (3 Lec)**

PREREQUISITE: BIOB 375 or equivalent General Genetics course. (Sp) PREREQUISITE: BIOB375. Advanced Eukaryotic Genetics will root recent genetic findings into a classical genetic context, with a primary goal of empowering students to read and interpret classical and current literature in the field of genetics and apply genetic analysis to research problems

## **PSPP 542 Genetics of Plant Improvement: 3 Credits (3 Lec)**

PREREQUISITE: AGSC 441, STAT 401. The past, present and future of plant improvement. Emphasis on genetic principles underlying classical plant breeding, and on molecular biological principles underlying plant genetic engineering

## **PSPP 546 Herbicide Physiology: 3 Credits (3 Lec)**

PREREQUISITE: BCH 380 and BIOO 433 or equivalents. (Sp) Offered every other Spring, even numbered years. A team-taught, distance delivery course on the biochemistry and physiology of herbicide action in plants. Herbicide discovery, classification, and mechanisms of action and resistance are explored

## **PSPP 547 Biomimicry for Teachers: 2 Credits (1 Lec, 1 Other)**

PREREQUISITE: Graduate students only. (Sp) Biomimicry is a new paradigm that assists in the understanding of how to take a function in nature and translate the design for human use. Biomimicry is multi-disciplinary, challenging the student to research the literature, analyze, synthesize, and evaluate, combining both biology and design innovation. Students must be able to research and read the academic literature, and translate biological concepts into layperson explanations, focusing on function, mechanism, and design principles. Offered Summer Repeatable up to 2 credits.

## **PSPP 548 Flowering Plants of the Northern Rocky Mountains: 2 Credits (2 Lec)**

(Su) A field oriented study of the flowering plants of Montana with an emphasis on plant keying skills. Objectives are: 1) to identify the parts of flowering plants and become familiar with botanical terms; 2) to learn morphological characteristics of common plant families; 3) to learn how to use a plant key to successfully identify flowering plants; application of these skills and botanical texts to the classroom. Mon - Tues are class/lecture days; Wed - Fri are day field trips to local trail heads. Offered Summer.

## **PSPP 549 Plants, People, Health for Teachers: 2 Credits (1 Lec, 1 Lab)**

(Su) This interdisciplinary course investigates how plants and people intersect, with a focus on the current popular and scientific interest in using plants and their compounds for health and medicine. The subject will be applied to ethnobotany, botany, and phytochemistry. The last day will be spent with hands-on experience making some herbal products to enhance the learning opportunity. Offered Summer.

## **PSPP 550 Plant Disease Control: 4 Credits (4 Lec)**

PREREQUISITE: BIOM 421 Concepts in Plant Pathology or consent of instructor

COREQUISITE: STAT 511 or PSPP 516. (Sp) Offered every other Spring, odd numbered years. Plant pathogens present major biological constraints in all crop production systems. For their management, we make numerous compromises between disease losses, and management costs in terms of monies, effort, and environmental impacts. In this course, important representative diseases from each disease class will be presented. These will be followed by discussions of the applied research on their control. Following Wednesday's lectures a one-hour review will be conducted of presented papers including methods, data quality, utility and contextual fit within the body of research on each subject

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## **PSPP 565 Plant-Pathogen Interaction: 3 Credits (3 Lec)**

(Sp) Offered every other Spring, even numbered years. Co-convened with BIOM 465. This course teaches the molecular mechanisms by which plants and pathogens/insects interact during the progress of pathogenesis or resistance, and the methods to study and visualize intercellular interactions during pathogenesis and defense.

## **PSPP 575 Professional Paper: 1-10 Credits (1 Other)**

PREREQUISITE: Graduate standing. (F, Sp, Su) A research or professional paper or project dealing with a topic in the field. The topic must have been mutually agreed upon by the student and his or her major adviser and graduate committee Repeatable up to 10 credits.

**PSPP 589 Graduate Consultation: 1-3 Credits (1-3 Other)**

PREREQUISITE: Master's standing and approval of the Dean of Graduate Studies. (F, Sp, Su) This course may be used only by students who have completed all of their coursework (and thesis, if on a thesis plan), but who needs additional faculty or staff time help

**PSPP 590 Master's Thesis: 1-10 Credits (1 Other)**

PREREQUISITE: Master's standing  
Repeatable up to 10 credits.

**PSPP 591 Special Topics: 1-4 Credits (1 Lec)**

PREREQUISITE: Upper division courses and others as determined for each offering. Courses not required in any curriculum for which there is a particular one time need, or given on a trial basis to determine acceptability and demand  
Repeatable up to 12 credits.

**PSPP 592 Independent Study: 1-3 Credits (1 Lec)**

PREREQUISITE: Graduate standing, consent of instructor, approval of Department Head and Dean of Graduate Studies. (F, Sp, Su) Directed research and study on an individual basis  
Repeatable up to 6 credits.

**PSPP 594 Seminar: 1 Credits (1 Other)**

PREREQUISITE: Graduate standing or seniors by petition. (F, Sp) Course prerequisites as determined for each offering. Students prepare, present, and critique scientific presentations  
Repeatable up to 4 credits.

**PSPP 598 Internship: 2-4 Credits (2 Other)**

PREREQUISITE: Graduate standing, consent of instructor and approval of Department Head, and Dean of Graduate Studies. (F, Sp, Su) An individualized assignment arranged with an agency, business or other organization to provide guided experience in the field  
Repeatable up to 12 credits.

**PSPP 642 Structural and Functional Genomics: 3 Credits (2 Lec, 1 Lab)**

PREREQUISITE: BIOB 375. (F) Offered every other Fall, odd numbered years. The objective of this course is to teach graduate students cutting-edge technologies used in omics with practical training in online databases and analytical tools. Students are expected to learn basic approaches in functional genomics, including forward and reverse genetics, transposon insertion, RNA interference (RNAi), TILLING (Targeted Induced Local Lesion IN Genomes), fine structure genetics (Modifier screens, Enhancer trap, GAL4 mediated over-expression), and current platforms for genome-editing. Laboratory sections will be computer-based, using publicly available online resources. Students will explore archives and sequence assemblies, analyze single molecules, navigate genome browsers, use comparative mapping tools, and work with phenotype/genotype data for genome-wide association studies (GWAS)

**PSPP 690 Doctoral Thesis: 1-10 Credits (1 Other)**

PREREQUISITE: Doctoral standing  
Repeatable up to 10 credits.