College of Science

Ph. D. Botany | Ph. D. Microbiology

Ph. D. Botany

First Semister

Course code	Course Title	Units
BOT 611	Advanced Plant Anatomy	2
BOT 641	Basic characteristics of habitats and their plants in Saudi Arabia	2
BOT 651	Gene regulation and development patterns	2
BOT 671	Advanced stress physiology	2
BOT 691	Seminar	1
Total	*Units*	*9*

Second Semister

The Department directs the student to select 9 study units from the next courses according to the field of his fine speciality (Plant Physiology, Plant Ecology or Plant Gentics)

Course code	Course Title	Units
BOT 621	Advanced Experimental Taxonomy	2
BOT 642	Seed Ecology	2
BOT 652	Introduction to Gentic Engineering	2
BOT 672	Advanced study in plant growth regulators	2
BOT 673	Plant Cell Metabolism	2
BOT 674	Seed Physiology	2
BOT 69	Special Topics	3
BOT 700	Dissertation	6

Ph. D. Botany Course Description

Bot. 611: Advanced Plant Anatomy 2 (2+0)

Anatomy and taxonomy, Anatomy and phylogeny. Comparative anatomy. Ecological anatomical adaptations of plants to arid and other environments. Scanning electron microscopy and its applications.

Bot. 621: Advanced Experimental Taxonomy 2 (2+0)

Polymorphism and species. Speciation and species limits. Plant Taxonomy and Phylogeny. Ecological and anatomical criteria in Plant Taxonomy. Hybridization, Endemims, Usage of Computor in Taxonomy.

Bot. 641: Basic characteristics of habitats and their plants in Saudi Arabia 2 (2+0)

Natural, regenerated resources. Endangered and rare plant taxa in various habitats in the Kingdom of Saudi Arabia. Reserves and their types. Conserved areas and the plant communities they harbour. Example of selected high altitudina, locations with special reference to some their distinctive taxa. Ecological evaluation of botanical data gathered under natural and experimental conditions.

Bot. 642: Seed Ecology 2 (1+1)

Dynamics of seed reproduction in plants. Post-dispersal of seeds and prior danger. Soil as seed storage. Seed dormancy and its effects on germination. Example of seed dormancy and the strategy of seed germination in desert and other habitats under natural conditions in the Kingdom of Saudi Arabia.

Bot. 651: Gene regulation and development patterns 2 (2+0)

Introduction and repression pattern in prokaryotes. The operon model, Lac operon, control of gene expression in eukaryotes. Control of cell divisiions, Oncogeny and photooncogeny.

Bot. 652: Introduction to Gentic Engineering 2 (2+0)

Aspects and methods in genetic engineering. Genetic engineering of plant using crown gall. The experimentally controlled introduction of DNA into yeast cells.

Bot. 671: Advanced stress physiology 2 (2+0)

Types of environmental stresses. Effect of stress with emphasis on drought, high temperature, high light intensity and salt on growth, development and metabolism. Mechanisms of physiological and biochemical adaptation to stresses. Improvement of crop growth and production under stresses. Improvemen of crop growth and production under stresses. Physiology of desert plants and halophytes.

Bot. 672: Advanced study in plant growth regulators 2 (2+0)

The nature of plant growth regulators, biosynthesis and metabolism. Modes of movements (mainly auxins) and the mechanisms of the regulators action. Phytochromes and photomorphogenesis and the possibel role of growth regulators.

Bot. 673: Plant Cell Metabolism 2 (2+0)

Application of thermodynamics law to the cell. Structure and functions of organells. Conversion of energy and matter.

Bot. 674: Seed Physiology 2 (2+0)

Types of seeds, fruit and seed development, physical and composition of seeds, factors affecting seed development and germination, domancy, inhibition and stimulation of seed germination, metabolism of germinating seeds, effect of inhibitors and stimutants on their metabolism.

Bot. 691: Seminar 1 (1+0)

Presentation and discussion of selected topics in botany according to the guidance of the course instructor.

Bot. 692: Special topics 3 (2+1)

Advanced topics in botany (Ecology, Genetics, physiology, Anatomy, Taxonomy) according to the need of the student and guidance of the supervisor.

Bot. 700: Dissertation

Ph. D. Microbiology

First Semister

Course code	Course Title	Units
MIC 611	Molecular Biology of Viruses	2
MIC 621	Advanced studies in Bacteriology	2
MIC 631	Advanced Biology of Fungi	2
MIC 671	Advanced Topics in Micro-Algae	2
MIC 691	Seminar	1
Total	*Units*	*9*

Second Semister

The Department directs the student to select 9 study units from the next courses according to the field of his fine speciality (Bacteriology, Mycology, Virology or Phycology)

Course code	Course Title	Units
MIC 612	Technology and new Advancement in Virology	2
MIC 622	Advanced Pathogenic Bacteria	2
MIC 623	Antibacterial agents and plasmids	2
MIC 632	Advanced fungal parasitism	2
MIC 633	Advanced studies in fungal symbiosis	2
MIC 641	Advanced microbial ecology	2
MIC 651	Applied Serology and Vaccines	2
MIC 652	Techniques in microbial molecular genetics	2
MIC 661	Spores biology	2
MIC 662	Advanced medical microbiology	2
MIC 692	Special topics	3
MIC 700	Dissertation	6

Ph. D. MIC Course Description

Mic. 611: Molecular Biology of Viruses 2 (2+0)

Introduction on the molecular biology of plant, animal and bacterial cells. Transcription, translation and replication of different viruses. Gene expression in vitro and in vivo-laboratory applications, genetic maps-interactions with host-activities.

Mic. 612: Technology and new Advancement in Virology 2 (2+0)

Studies on viruses infecting tissue cultures and protoplast methods for detection of viral infections and diagnosis using molecular probes, recombinant DNA technology, gene description and mapping techniques on genetic engineering and the epidemics.

Mic. 621: Advanced studies in Bacteriology 2 (1+1)

Supervised readings and discussion of experimental approaches in bacteriology including related Journals.

Mic. 622: Advanced Pathogenic Bacteria 2 (2+0)

Detailed study of frequency isolated pathogenic bacteria including intracellular bacteria.

Mic. 623: Antibacterial agents and plasmids 2 (1+1)

Advanced lectures and laboratory studies in antibiotics with reference to antibiotics resistance particularly these mediated by plasmids.

Mic. 631: Advanced Biology of Fungi 2 (1+1)

Structure and function of fungi, growth and nutrition dispersal of fungi, ecology of saprophytic fungi, fungal genetics, resistance virulence.

Mic. 632: Advanced fungal parasitism 2 (2+0)

Fungal life-style. Plants as an environment fungus plant conformation. Effects of pathogenic fungal infusion on host plant plant physiology. Biotechnology in the study of fungus-plant interactions.

Mic. 633: Advanced studies in fungal symbiosis 2 (1+1)

Detailed study of physiology and structure of symbiotic fungi, host-symbiont interactions, their effects on host growth and their agricultural applications.

Mic. 641: Advanced microbial ecology 2 (2+0)

Concepts in ecology as applied to mcirobial systems including analysis of communities, interactions and biogeochemical factors.

Mic. 651: Applied Serology and Vaccines 2 (1+1)

Basis of immunology; revision. Sera and serological techniques in identification of bacteria, viruses, fungi and protozoa and their application techniques of monoclonal antibodies. Vaccines technology and design and against viral, bacterial, fungal protozooms diseases-new developments.

Mic. 652: Techniques in microbial molecular genetics 2 (2+0)

Genetic manipulation of bacteria, virusus, bacteriophage and yeast. Fundamentals of gene splicing and molecular cloning. Applications.

Mic. 661: Spores biology 2 (2+0)

Mechanisms of he formation and germination of spores their toleration to ecological factors and their role in the microbial dispersal, pollution and infectioin.

Mic. 662: Advanced medical microbiology 2 (2+0)

Pathogenesis of bacterial, fungi and viruses. The major epidemic diseases. Immune interaction chemotherapy, vaccination and control measures. Gene therapy.

Mic. 671: Advanced topics in Microalgae 2 (2+0)

Recent advances in micro-algae, assigned readings reports and discussion, may include laboratory work.

Mic. 691: Seminar 1 (1+0)

Selected topics presentation and discussion of in microbiology accroding to the guidance of the course instructor.

Mic. 692: Special topics 3 (2+1)

Advanced topics in Microbiology (Virology, Bacteriology, Mycology, Phycology) according to the need of the student and guidance of the supervisor.

Mic. 700: Dissertation