Ph.D. in Botany

Eighteen hours (18) divided on two semesters, should studied. Students should study 9 hours as compulsory courses in the first semester, and select 9 of 16 hour as elective courses.

A- Compulsory courses. (9 hours)

Course code	Name	units
611 Bot	Advanced plant anatomy	2(2+0)
641 Bot	Plants and habitats features in in Saudi Arabia	2(1+1)
651 Bot	Gene regulation and development patterns	2(2+0)
671 Bot	Advanced stress physiology	2(2+0)
691 Bot	Seminar	1 (1+0)

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. 641: Plants and habitats features in 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 harbor. Example of selected high altitudina, locations with special references to some their distinctive taxa. Ecological evaluation of botanical data gathered under natural and experimental conditions.

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. 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. 691: Seminar 1 (1+0)

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

B- Elective courses. (9 hours)

Course code	Name	units
621 Bot	Advanced Experimental Taxonomy	2(2+0)
642 Bot	Seed Ecology	2(1+1)
652 Bot	Introduction to Gentic Engineering	2(2+0)
672 Bot	Advanced study in plant growth regulators	2(2+0)
673 Bot	Plant Cell Metabolism	2(2+0)
674 Bot	Seed Physiology	2(2+0)
692 Bot	Special topics	3(2+1)
575 Bot	Biosynthesis and natural products	2(2+0)
	Bioinformatics (core71)	
	Genomics and Proteomics	
	Plant protection	
	Plant Biosynthesis	
	Plant transgenic systems	

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. 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. 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. 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. 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. : Biosynthesis and natural products

Bot. : Bioinformatics (core7)

Bot. : Genomics and Proteomics

Bot. : Plant protection

Bot. : Plant Biosynthesis

Bot. : Plant transgenic systems

700 Bot	Thesis	6(6+0)

Bot. 700: Dissertation 6(6+0)