

## PhD Botany Short Course Description

| Course Code  | Course Title   | Credits (Lect.-<br>Exre.-Pract.) |
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| BOT 611  | ADVANCED PLANT ANATOMY   | 2(2+0+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+0)                         |
| Polymorphism and species. Speciation and species limits. Plant Taxonomy and Phylogeny. Ecological and anatomical criteria in Plant Taxonomy. Hybridization, Endemism, Usage of Computer in Taxonomy.   |  |                                  |
| BOT 641  | BASIC CHARACTERISTICS OF HABITATS & THEIR PLANTS IN SAUDI ARABIA | 2(2+0+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 altitudinal locations with special references to some their distinctive taxa. Ecological evaluation of botanical data gathered under natural and experimental conditions. |  |                                  |
| BOT 642  | SEED ECOLOGY   | 2(1+0+2)                         |
| 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 & DEVELOPMENT PATTERNS                           | 2(2+0+0)                         |
| Introduction and repression pattern in prokaryotes. The operon model, Lac operon, control of gene expression in eukaryotes. Control of cell divisions, Oncogeny and photooncogeny.   |  |                                  |
| BOT 652  | GENETIC ENGINEERING  | 2(2+0+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+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. Improvement of crop growth and production under stresses. Physiology of desert plants and halophytes. |  |                                  |

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| BOT 672  | ADVANCED STUDY IN PLANT GROWTH REGULATORS | 2(2+0+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 possible role of growth regulators.  |   |          |
| BOT 673  | PLANT CELL METABOLISM                     | 2(2+0+0) |
| Application of thermodynamics law to the cell. Structure and functions of organelles. Conversion of energy and matter.   |   |          |
| BOT 674  | SEED PHYSIOLOGY                           | 2(2+0+0) |
| Types of seeds, fruit and seed development, physical and composition of seeds, factors affecting seed development and germination, dormancy, inhibition and stimulation of seed germination, metabolism of germinating seeds, effect of inhibitors and stimulants on their metabolism. |   |          |
| BOT 691  | SEMINAR                                   | 1(1+0+0) |
| Presentation and discussion of selected topics in botany according to the guidance of the course instructor.   |   |          |
| BOT 692  | SPECIAL TOPICS                            | 3(3+0+0) |
| Advanced topics in botany (Ecology, Genetics, physiology, Anatomy, Taxonomy) according to the need of the student and guidance of the supervisor.  |   |          |
| BOT 699  | RESEARCH PROPOSAL PREPARATION             | 0(0+0+0) |
| The student must submit a written research plan to be consider by Research Committee for evaluation to be approved by Department Council   |   |          |
| BOT 700  | RESEARCH (THESIS)                         | 1(0+0+6) |
| The student must submit a long thesis involving proposal research, written by a candidate for a university degree  |   |          |
| COM 700  | COMPREHENSIVE EXAM                        | 0(0+0+0) |
| Intensive examination testing a student's proficiency in Botany field  |   |          |