

## M. Sc. Botany Program | M. Sc. Microbiology Program

### M. Sc. Botany Program

#### 1<sup>st</sup> Level

BOT 512	Plant Surfaces	2
BOT 521	Advanced Angiosperm Taxonomy	2
BOT 541	Advanced Plant Ecology	2
BOT 551	Advanced Genetics	2
BOT 571	Biosynthesis	2
<i>Total</i>	<i>Units</i>	<i>10</i>

#### 2<sup>nd</sup> Level

BOT 514	Applied Plant Anatomy	2
BOT 523	Field Systematics	2
BOT 543	Desertification and Conservation of Resources	2
BOT 572	Plant Mineral Nutrition	3
BOT 591	Special Topics	1
Total	Units	10

#### 3<sup>rd</sup> Level

BOT 553	Advanced Cytogenetics	3
BOT 592	Semester	1
BOT 600	Thesis (Research)	6
<i>Total</i>	<i>Units</i>	<i>10</i>

#### 4<sup>th</sup> Level

MIC 600	Thesis (Research)	6
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### M. Sc. Botany course description

BOT 512 Plant Surfaces (1+1) credit-hours.

*Benefiting College: Science.*

Introduction, Techniques for studying plant surfaces. Anatomy, ultrastructure and biosynthesis of plant surface, plant surfaces in action., reproduction and dispersal, plant surfaces as sources of materials, as a habitat.

BOT 514 Applied Plant Anatomy (1+1) credit-hours.

*Benefiting College: Science.*

Introduction, tissue systems, histology of leaf, stem and root, meristematic tissues, secondary xylem, secondary phloem adaptive features, flowers and fruits, economic aspects of applied plant anatomy.

BOT 521 Advanced Angiosperm Taxonomy (1+1) credit-hours.

*Benefiting College: Science.*

The concept of characters, Taxonomic value of morphology, Anatomy, Palynology, Cytology Phytochemistry, Modification of the phenotype, Evolution and the differentiation of species, Variation with in the populations, populations and the environment, polyploidy and taxonomy.

BOT 523 Field Systematics (1+1) credit-hours.

*Benefiting College: Science.*

Study of flowing plant populations as exhibited in Flora of Saudi Arabia, floristic and ecological survey, geographical distribution and means of dispersal. Collection and preservation of field material. Herbarium methodology. Field trip of about 10 days to a selected area.

BOT 541 Advanced Plant Ecology (1+1) credit-hours.

*Benefiting College: Science.*

Seed Ecology, heavy metals toxicity. Effect of pollutants of plants. Plants as habitat indicators.

BOT 543 Desertification and Conservation of Natural Resources

*Benefiting College: Science.*

Terminology, desertification Worldwide and in Arab countries causes, impacts and aspects. Modern approaches to combat desertification. Natural resources and their conservation.

BOT 551 Advanced Genetics (2+0) credit-hours.

*Benefiting College: Science.*

The genetics material, role, structure and function. Mutation and mutagenesis. Genetic engineering, methods and application.

BOT 553 Advanced Cytogenetics (2+1) credit-hours.

Variation of chromosome number on cultivating plants, polyploidy aneuploidy, change in chromosome structure, Linkage and crossing over, chromosome mapping.

BOT 571 Biosynthesis (2+0) credit-hours.

*Benefiting College: Science.*

Photosynthesis in green plants and carbohydrate synthesis, phosphorylation and ATP cycle. Lipid and proteins synthesis. Coenzymes and some biologically important compounds synthesis. Energy requirement and quantum yield of these processes.

BOT 572 Plant Mineral Nutrition (2+1) credit-hours.

*Benefiting College: Science.*

Physiological role of essential elements, Deficiency symptoms. Uptake mechanism. Control and regulation of transport in tissues and whole plant. Distribution and translocation of organic compounds as well as growth regulators.

BOT 591 Special Topics (2+0) credit-hours.

*Benefiting College: Science.*

Covers advanced and recent topics in Botany according to student's area of interest.

BOT 592 Seminar (1+0) credit-hours.

*Benefiting College: Science.*

The student should review one related subject and present it as a seminar.

BOT 600 Thesis (Research) (1+0) credit-hours.

*Benefiting College: Science.*

## M. Sc. Microbiology Program

### 1<sup>st</sup> Level

MIC 511	Advanced Virology	2
MIC 521	Advanced Bacteriology	2
MIC 531	Advanced Mycology	2
MIC 561	Advanced Microbiological Physiology	2
MIC 571	Advanced Studies in Micro-algae	2

### 2<sup>nd</sup> Level

MIC 522	Mechanism of Bacterial Infection	2
MIC 532	Mycotoxins	2
MIC 566	Microbial Biotechnology	2
MIC 572	Biology of Prokaryotic Algae	2
MIC 591	Special Topics	2

### 3<sup>rd</sup> Level

MIC 555	Microbial Molecular Genetics	3
MIC 592	Seminar	1
MIC 600	Thesis (Research)	6

### 4<sup>th</sup> Level

	Thesis (Research)	6
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## M. Sc. Microbiology course description

MIC 511 Advanced virology (2+1) credit-hours.

*Benefiting College: Science.*

Recent advances in virology, antiviral drug, immunity to viral infection and vaccination.

MIC 521 Advanced Bacteriology (1+1) credit-hours.

*Benefiting College: Science.*

Advanced descriptive and physiological studies of bacteria.

MIC 531 Advanced Mycology (1+1) credit-hours.

*Benefiting College: Science.*

Nomenclature, phylogeny, hyphal ultrastructures and growth, genetic systems, special group of fungi, recent literature.

MIC 561 Advanced Microbiological Physiology (1+1) credit-hours.

*Benefiting College: Science.*

Biological activities of microorganisms, aerobic and anaerobic metabolic conversions, biosynthetic pathways regulation, phase of enzymatic synthesis and their activities, sporulation cases and hyphal cell wall changes etc.

MIC 571 Advanced studies in Micro-algae (1+1) credit-hours.

*Benefiting College: Science.*

Survey of micro-algae in local habitats, isolation, culturing identification and systematic. Relationships of micro-algae to the physiol, chemical and biological aspects of their environments. Factors regulating their distribution. Class and individual collection trips. Independent research projects are required.

MIC 522 Mechanism of bacterial infection (1+1) credit-hours.

*Benefiting College: Science.*

Bacterial toxins, role of iron in infection, bacteria-phagocyte interaction.

MIC 532 Mycotomins (1+1) credit-hours.

Types, isolation methods, purification, circumstances in which they produced, fungal groups which produce toxins.

MIC 555 Microbial Molecular Genetics (2+1) credit-hours.

*Benefiting College: Science.*

Microbial genome structure, mutations, gene transfer and genetic mapping, plasmids, recombinant DNA mechanisms uses, gene regulation.

MIC 566 Microbial Biotechnology (1+1) credit-hours.

*Benefiting College: Science.*

Current techniques in microorganisms, including specimen handling and laboratory safety, microbial fermentation, bioconversion, and their uses in industrial processes.

MIC 572 Biology of Prokaryotic Algae (1+1) credit-hours.

*Benefiting College: Science.*

Cyanophyta and prochlorophyta, emphasis on form and structure, patterns of development and reproduction, metabolism, ecology, genetics, evolution, and taxonomy.

MIC 591 Special Topics (2+0) credit-hours.

*Benefiting College: Science.*

Covers advanced and recent topics in microbiology according to the student's area of interest.

MIC 592 Seminar (1+0) credit-hours.

*Benefiting College: Science.*

The student should review one related subject and present it as a seminar.

MIC 600 Thesis (Research) (0+6) credit-hours.

*Benefiting College: Science.*