

# DEPARTMENT OF LIFE SCIENCES

## *Chairman*

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**Dr. Jameel AlThaqfi**

## *Faculty*

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Ahmad  
Al Dakhil - Allah

Al-Thukair  
Khalil

Nzila  
Siddiqui

Rapid advances in biology are opening up a multitude of new research and business opportunities in life science related industries. The Master Program in Life Sciences is organized around biotechnology, biochemistry, cell biology, molecular biology, microbiology, ecology, ...etc. Within this program, students can tailor their studies, to the type of employment and research they would like to pursue in the future. The program provides postgraduate education to qualified students and prepare them for careers in biological sciences such as laboratory specialist in pharmaceutical, medical, and forensic medicine, or in the food, environmental and agro-technology industries. It also trains postgraduate students in various fields of biotechnology, and prepares them to meet the future needs of the Kingdom and for more advanced studies.

### **Admission Requirements**

Admission to the Master Program in Life Sciences requires fulfilling all requirements of the Deanship of Graduate Studies. The following are additional requirements:

- A four-year Bachelor's Degree in Biology (Life sciences) from a recognized institution with evidence of a suitable background for entering the proposed field,
- A Grade-Point Average (GPA) of 3.00 or higher on a scale of 4.00 or equivalent, and a GPA of 3.00 in the subject of the major field. A student may be admitted on a provisional basis if his GPA is below 3 but not less than 2.5. In this case, the student has to score a minimum grade B on a number of Biology courses determined by a departmental committee.

## MASTER IN LIFE SCIENCES

### Degree Requirements

(a) Core Courses (18 credit hours)	Credit Hours
Microbiology	LS 511 3
Cellular and Molecular Biology	LS 541 3
Techniques in Biology	LS 546 3
Ecology and Evolution	LS 551 3
Seminar	LS 599 0
Thesis	LS 610 6
<b>(b) Elective Courses (12 credit hours)</b>	
Three LS Courses	LS xxx 9
One Free Elective Course	XXX xxx 3

### Degree Plan

COURSE	TITLE	LT	LB	CR	COURSE	TITLE	LT	LB	CR
<b>First Year</b>									
LS 511	Microbiology	3	0	3	LS 546	Techniques in Biology	2	2	3
LS 541	Cellular and Molecular Biology	3	0	3	LS 551	Ecology and Evolution	3	0	3
LS xxx	LS Elective I	3	0	3	LS xxx	LS Elective II	3	0	3
					LS 599	Seminar	1	0	0
		<b>9</b>	<b>0</b>	<b>9</b>			<b>9</b>	<b>2</b>	<b>9</b>
<b>Second Year</b>									
LS xxx	LS Elective III	3	0	3	LS 610	Thesis	0	0	6
XXX xxx	Free Elective	3	0	3					
LS 610	Thesis	0	0	IP					
		<b>6</b>	<b>0</b>	<b>6</b>			<b>0</b>	<b>0</b>	<b>6</b>
<b>Total credit hours required in Degree Program : 30</b>									



**LS 541 Cellular and Molecular Biology (3-0-3)**

Chemical basis of life, the basic unit of life (the cell) in relation with structure and function, photosynthesis, cellular respiration, cell reproduction (mitosis & meiosis), cell cycle regulation. Cell communication, signal transduction, molecular basis of carcinogenesis Molecular structures and mechanisms involved in the storage, transmission and utilization of genetic information in simple and complex organisms, gene transcription and translation, principles and methodology of recombinant DNA.

**Prerequisite:** Graduating Standing

**LS 542 Biotechnology (3-0-3)**

Application of genetics and molecular biology to the developments of biotechnological products in medicine, environment, agriculture and industrial manufacture, fundamental issues of biotechnology, development of biotechnology, practical techniques of biotechnology, implication of biotechnology applications to the lives of humans and other animals, plants and the environment.

**Prerequisite:** LS 541

**LS 546 Techniques in Biology (2-2-3)**

Electrophoresis, chromatography, Uv-Vis spectrophotometry, fluorescence spectroscopy, circular dichroism, biocalorimetry (isothermal titration calorimetry, iTC; differential scanning calorimetry, DSC), Mass spectrometry (MS), light and electron microscopy.

**Prerequisite:** LS 521

**LS 551 Ecology and Evolution (3-0-3)**

Understanding of resource sharing among communities, and fundamental concepts of terrestrial and aquatic environments, Global changes and nutrient cycling, nutrient availability, resource competition among individuals and within a community, abundance of organisms and human interactions, primary production, decomposition, and microbial ecology.

**Note:** LS 551 is equivalent to ENVS 533.

**Prerequisite:** Graduating Standing

**LS 562 Invertebrate (3-0-3)**

Evolutionary and physical diversity of invertebrates, phylogenetic relationships among the metazoans; biodiversity represented by invertebrates; patterns of evolution within the major phyla, classification, systematic, and phylogeny, animal development, life histories and origin of various invertebrate phyla.

**Prerequisite:** Graduating Standing

**LS 563 Paleobiology (3-0-3)**

Evolutionary aspects of paleobiology as science, including; the growth of theoretical paleobiology, punctuated equilibrium, Taphonomy and the quality of fossil record, toxic paleobiology, macroevolution, paleoecology and paleoclimate.

**Prerequisite:** Graduating Standing



