

## *Msc Program In Biodiversity*

### Program Background .

Biodiversity and Conservation become one of the priorities of all nations on our planet . This was clear by the signing of more than 150 countries on the Biodiversity treaty in the United Nations Conference in Brazil , 1992 . The conference stressed the importance of sustainable use of Biological resources of each country and the responsibility of the parties on conducting the necessary studies , training and mutual cooperation for the conservation of Biodiversity . The Kingdom joined the treaty on 14/2/2001) . The Kingdom realized the importance of protection and conservation of natural resources and to gain benefits of the outcome of parties signed the treaty .

### Program objectives .

- 1- To provide scientists and researchers with necessary skills and experiences in Biodiversity for the conservation of natural resources and national biological heritage .
- 2- To participate in studies and research with regard to the reserve of wildlife of the Kingdom and its useful utilization.
- 3- To focus on new situations and scientific interest on ecological issues and the biological contents in order to face obstacles that hinder progress to better life style .
- 4- To participate in national policies regarding the protection of wildlife , and to conduct studies in order to find the most appropriate solutions at the national and international levels.

### Admission requirements .

In addition to the university requirements the program requirements are as follows :

1- BSc in biological sciences : Botany , Zoology , Range science , Forestry , or related fields .

2- To attend an interview with program committee .

### Program Structure .

Study toward the degree will be by courses and thesis . According to semester program of the university . Student should complete 24 credit hours in three semesters , then he should work on his thesis in the field he chooses related to biodiversity topics.

### Program Courses .

#### *First Semester ..*

	Course No & Code	Course Title	No. Credits
1	570 Bid	Biodiversity Ecosystems	3 ( 3 + 0 )
2	571 Bid	Classification Of Wild Plant and Animal Groups	3 ( 2 + 1 )
3	572 Bid	Biodiversity and Environment	2 ( 2 + 0 )
4	567 Sosc	Soil Conservation	2 ( 2 + 0 )
Total			10

#### *Scand Semester ..*

	Course No & Code	Course Title	No. Credits
1	574 Bid	Biodiversity and Development	1 ( 1 + 0 )
2	575 Bid	Wildlife Management	2 ( 2 + 0 )
3	576 Bid	Monitoring and Observing Wild Plants and Animals	2 ( 1 + 1 )
4	577 Bid	Experimental Designs Of Biodiversity	2 ( 1 + 1 )
5	568 Plpr	Range Management For Multiple Use	2 ( 2 + 0 )
Total			9

*Third Semester ..*

The program supervising comity will chose 5 credit hours from the following course :

	Course No & Code	Course Title	No. Credits
1	519 Anpr	Nutrition Of Wild Animals	3 ( 2 + 1 )
2	580 Bid	Seminar	3 ( 2 + 1 )
3	581 Bid	Health Management Of Wild Animals	3 ( 2 + 1 )
4	582 Bid	Diseases and Protection Of Wild Plants	2 ( 2 + 0 )
5	583 Bid	Laws and Legislation Of Environmental Conservation	1 ( 1 + 0 )
6	541 Bot	Advanced Course In Ecology	2 ( 1 + 1 )
	573 Zoo	Advanced Ecology	3 ( 2 + 1 )
7	543 Bot	Desertification and Conservation Of Natural Resources	2 ( 2 + 0 )
8	551 Bot	Advanced Genetics	2 ( 1 + 1 )
	552 Zoo	Quantitative and Population Genetics	2 ( 1 + 1 )
9	551 Plpr	Silvis Culture	2 ( 2 + 0 )
10	572 Zoo	Animal Conservation	2 ( 2 + 0 )

*Following Semesters ..*

	Course No & Code	Course Title	No. Credits
1	600 Bid	Thesis	6

**Courses - prescription:**

<b>570 Bid</b>	<b>Biodiversity in Ecosystems</b>	<b>3 ( 3 + 0 )</b>
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Biomes. Concept and importance of biodiversity in ecosystems. Geographical distribution of plants and animals. Arid regions: geography, characteristics, and its effect on biotic components. Biodiversity in deserts, ranges, and forests. Biodiversity in aquatic ecosystems.

<b>571 Bid</b>	<b>Classification of Wild Plant and Animal Groups</b>	<b>3 ( 2 + 1 )</b>
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Concept of classification: aims and principles. Plant diversity: various types and classification. Animal diversity : groups and classification. Morphological and anatomical diversity of living organisms. Genetic diversity. Types of life cycles in biodiversity. Classification of rare and endangered species.

<b>572 Bid</b>	<b>Environment and Biodiversity</b>	<b>2 ( 2 + 0 )</b>
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Relationship between environment and biodiversity. Ecological factors and their effect on the distribution and physiology of plants and animals: physical, chemical and biological factors. Pollution and biodiversity. Pollutants and its sources. Effect of pollution on plants and animals: air, water and soil pollution. Species extinctions. Use of plants and animals as pollution indicators. The impact of social developments and the implementation of International laws of environmental protection on biodiversity.

<b>574 Bid</b>	<b>Biodiversity and Development</b>	<b>1 ( 1 + 0 )</b>
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Biodiversity in Islam, Social views on biodiversity, Development and biodiversity. Economic, aesthetic and recreational values of biodiversity. The effect of implementation of protection laws on biodiversity.

<b>575 Bid</b>	<b>Wildlife Management</b>	<b>3 ( 2 + 1 )</b>
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Concepts of wildlife management and conservation. Biology of wildlife: food, water, habitat, behavior, and reproduction. Population dynamics: characteristics, density concept; population regulation, population structure, dispersal and dispersion; territory concept and predator-prey relationship. Management and research techniques ; age and sex determination, animal capture and translocation techniques, and predators control. Monitoring and observation of wild animals and plants, and methods of their identification. Practical management of wildlife: information, requirements for setting up a management plan of a naturally protected sanctuaries.

<b>576 Bid</b>	<b>Seminar</b>	<b>1 ( 1 + 0 )</b>
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Selection of topics on the student related research field. Student is required to present and discuss his findings.

<b>577 Bid</b>	<b>Biological Experimental Designs and Analysis</b>	<b>2 ( 1 + 1 )</b>
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Surveys and censuses methodology. Fundamentals of experimental design, Fundamentals of experimental biodiversity sampling. Experimental population. Population growth and estimations. Methods of tabulation and graphical representation. Methods of choosing a statistical test. Tests for one, two and multiple variables. Methods of testing variations, regressions, and correlations. Computer applications and the use of Biodiversity programs.

<b>580 Bid</b>	<b>Wild Animal Diseases and Protection</b>	<b>3 ( 2 + 1 )</b>
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Enzootic and parasitic diseases in range lands. Predisposing factors of wild animal diseases. Nutritional deficiencies. Effects of poisonous plant-materials on animal health. Veterinary care in range lands. Disease control in wild animals.

<b>581 Bid</b>	<b>Wild Plants Diseases and Protection</b>	<b>3 ( 2 + 1 )</b>
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Parasitism and disease development. Effects of pathogens on plant physiological functions. Effect of insects and Arthropods on Wildlife. Role of beneficial organism on natural communities. How plants defend themselves against pathogens. Effect of environment on plant diseases. Control of diseases. Agents of infectious diseases. Agents of non-infectious disease.

<b>582 Bid</b>	<b>Genetic Resources</b>	<b>2 ( 2 + 0 )</b>
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In-situ conservation and Ex-situ conservation of genetic resources (seed conservation, conservation of vegetative parts and live plants, botanic gardens), conservation of animal resources, collection of genetic resources. National and international gene banks and programs, Seed collection (basic collection-active collections – core collections), Germ-plasm characterization and evaluation, ( domestication-introduction-gene transfer of desired trait broadening the genetic base). Germ-plasm enhancement.

<b>583 Bid</b>	<b>Laws and Legislation of Environmental Protection</b>	<b>1 ( 1 + 0 )</b>
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Importance and effectiveness of legislation on environment protection. International legislation, regional, local and national legislation. International agreements and conventions controlling environmental protection and natural resources manipulation. International organizations for environment protection.

<b>600 Bid</b>	<b>Thesis</b>	<b>6 ( 0 + 6 )</b>
<b>567 SOSC</b>	<b>Soil Conservation</b>	<b>2 ( 2 + 0 )</b>

Soil as a natural resource and its relationship to rangeland and forest resources. Soil water management, precipitation and surface runoff. Soil water erosion. Soil wind erosion. Universal soil loss equation. General and specific soil conservation practices.

<b>568 PLPR</b>	<b>Range Management for Multiple Use</b>	<b>2 ( 2 + 0 )</b>
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Rangeland use for livestock production. Rangeland and wildlife development. Conservation of genetic resources for economic plants. Watershed management. Recreational use of rangelands. Conflicts in multiple use of rangelands and conflict resolution to maintain biodiversity. Systems related to multiple use of rangeland.

<b>519 ANPR</b>	<b>Nutrition of Wild Animals</b>	<b>3 ( 2 + 1 )</b>
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Feed requirements of wild animals. Correction of nutritional deficiencies. Grazing and feeding behaviors of wild animals. Plants suitable for wild animals grazing. Nutritional values of range plants.

<b>552 ZOO</b>	<b>Quantitative and Population Genetics</b>	<b>2(1+1)</b>
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This course is intended to introduce the student to quantitative genetics, especially in constructing hypotheses and mathematical model building. Genetic structure of populations, forces of gene frequency changes, small populations, measurements of variation, resemblance between relatives, heritability, selection, inbreeding and crossbreeding, metric traits. BLUP estimation.

<b>572 ZOO</b>	<b>Animal Conservation</b>	<b>2 (2+0)</b>
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To provide students with basic information on animal resources in Saudi Arabia and methods of conservation. Ecological introduction, species and population characteristics, ecological equilibrium, and its importance extinction, wildlife in the Saudi Arabia (aquatic & terrestrial), the importance of animal conservation, endangered species, protected areas in Saudi Arabia, management of terrestrial and aquatic animals.

<b>573 ZOO</b>	<b>Advanced Ecology (1)</b>	<b>3 (2+1)</b>
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To provide graduate students with basic concepts of population and community Ecology of both terrestrial and aquatic animals. Characteristics of aquatic and terrestrial animal populations (natality rate, mortality rate, density, age distribution). Population growth, effect of a biotic factors on population growth (aquatic & terrestrial) species intra- and inter-relationships. Population cycles, community changes, desert animal communities.