Ministry of Higher Education and Scientific Research
University of Anbar
Education College for Women
Department of Biology

Department of Biology

Scientific Evidence

2020-2021

Vision: It is one of the scientific departments in the College of Education for Women, which constitutes one of the tributaries of the scientific community and is considered the cornerstone of all science and technology and the mission in the movement of society. It aims to devote scientific capabilities to maintain the highest scientific level, as it is based on providing scientific opportunities for students of primary and graduate studies through Spreading awareness and knowledge and providing the country with researchers and professors capable of dealing with modern changes and developments in the world, and contributing to the development of its health, environmental and scientific institutions in solving problems in the various life sciences disciplines**.**

The mission: To prepare female graduates and leaders with high scientific skills and research and teaching capabilities that keep pace with scientific development to work in the fields of life sciences in its various branches, advance a scientifically and intellectually distinguished generation, enhance women's status as an essential component of society, and free them from the restrictions of backward legacies that hinder their aspirations.

Objectives of the educational program: -

1- Developing the scientific competencies and teaching performance of researchers and students.

2- Developing and updating scientific curricula, both theoretical and practical.

3- The department seeks to adopt all modern scientific and technical means in developing scientific research in various fields of life sciences.

Curriculum for the Department of Biology
The First stage

Second Semester							First semester						
Units	hours			Course Code	Subjects	Types of academic subjects	Units	hours			Course Code	Subjects	Types of academic subjects
	discussion	practical	theoretical					discussion	practical	theoretical			
3	0	1	2	BIO103	Basics of Plant	Specialization	3	0	2	2	BIO102	Basics of zoology	Specialization
2	0	2	1	BIO101	Cytology 2		2	0	2	1	BIO101	Cytology 1	
2	0	2	1	CHEM110	organic chemistry	assistance	2	0	2	1	CHEM109	Analytical chemistry	assistance
2	0	0	2	ENGI101	English Language	General	2	0	0	2	ARAB101	Arabic Language	General
3	0	2	2	COMP101	Computers		2	0	0	2	BIO105	Earth science	
1	0	0	1		Freedoms		1	0	0	1		human rights	
2	0	0	2	PSE109	Foundations of education	Educational	2	0	0	2	PSE110	Educational psychology	Educational
15	0	8	11		Total hours and units		14	0	6	11		Total hours and units	

Curriculum for the Department of Biology
The Second stage

Second Semester							First semester						
Units	hours			Course Code	Subjects	Types of academic subjects	Units	hours			Course Code	Subjects	Types of academic subjects
	discussion	practical	theoretical					discussion	practical	theoretical			
3	0	2	2	EWB3202	Invertebrates 2	Specialization	3	0	2	2	EWB3201	Invertebrates 1	Specialization
3	0	2	2	EWB3209	Embryology		3	0	2	2	EWB3205	Histology	
3		2	2	EWB3207	Biochemistry		3		2	2	EWB3203	Comparative plant anatomy	
3	0	2	2	EWB3206	Archicons		3	0	2	2	EWB3204	Algology	
3	0	2	2	EWB3208	Life statistics	assistance	2	0	0	2	EWB2201	Scientific research method	assistance
2	0	0	2	EWB2203	educational administration	Educational	2	0	0	2	ENGI101	English Language	General
							2	0	0	2	EWB2202	Developmental psychology	Educational
17	0	10	12		Total hours and units		18	0	8	14		Total hours and units	

Curriculum for the Department of Biology
The Third stage

Second Semester							First semester						
Units	hours			Course Code	Subjects	Types of academic subjects	Units	hours			Course Code	Subjects	Types of academic subjects
	discussion	practical	theoretical					discussion	practical	theoretical			
3	0	2	2	EWB3308	Applied insects	Specialization	3	0	2	2	EWB3302	General insects	Specialization
3	0	2	2	EWB3309	Fungi		3	0	2	2	EWB3301	Chordates and comparative anatomy	
3		2	2	EWB3310	Plant classification		3		2	2	EWB3303	Genetics1	
3	0	2	2	EWB3311	Bio technology		3	0	2	2	EWB3305	General microbiology	
3	0	2	2	EWB3312	Animal physiology		3	0	2	2	EWB3306	Plant morphology	
3	0	2	2	EWB3304	Genetics2		2	0	2	1	EWB3307	Microscopic preparations	
2	0	0	2	EWB2302	Teaching methods	Educational	2	0	0	2	EWB2301	Counseling and mental health	Educational
2	0	0	2	ENGI101	English Language	General							
20	0	12	14		Total hours and units		19	0	12	13		Total hours and units	

Curriculum for the Department of Biology
The fourth stage

Second Semester							First semester						
Units	hours			Course Code	Subjects	Types of academic subjects	Units	hours			Course Code	Subjects	Types of academic subjects
	discussion	practical	theoretical					discussion	practical	theoretical			
3	0	2	2	EWB3402	Parasites 2	Specialization	3	0	2	2	EWB3401	Parasites 1	Specialization
3	0	2	2	EWB3408	Environmental pollution		3	0	2	2	EWB3403	Applied bacteriology	
3	0	2	2	EWB3409	Immunology		3	0	2	2	EWB3404	Ecology	
2	0	0	2	EWB3410	Public Health		3	0	2	2	EWB3405	Plant physiology	
2	0	0	2	EWB2402	Measurement and evaluation	assistance	3	0	2	2	EWB3406	Molecular biology	assistance
2	0	0	2	EWB3411	Optional		3	0	2	2	EWB3407	Cellular metabolism	
2	0	4	0	EWB2404	Teaching applications	Educational	2	0	4	0	EWB2401	Teaching applications	Educational
							2	0	0	2	ENGI101	English Language	General
3	0	6	0	Continuing with the second semester							EWB2403	Graduation research	assistance
20	0	16	12		Total hours and units		22	0	16	14		Total hours and units	

Courses – Department's specialized requirements

Course description:

Zoology: BIO102
It gives an idea about the history of the animal kingdom (its classification and scientific nomenclature) and identifies invertebrate animals, starting from protozoa to echinoderms, with a comparison.

Cell Biology: BIO101
Introducing the student to an introduction to the cell, the types of eukaryotic and prokaryotic cells, comparing them, and the different parts of the cell (cell wall, plasma membrane, nucleus, cytoplasm, endoplasmic reticulum, Golgi bodies, etc.), as well as identifying the stages of cell division

Botany: BIO103
Introducing the student to the classification of plants, as well as plant parts, the histological anatomy of plants, and the most important functions of plant tissues.

Geoscience: BIO105
Introducing the student to the geographical composition of the Earth's terrain, with an in-depth study of paleontology, as well as the distribution of various living organisms according to the geological nature of the terrain

Invertebrates 1: EWB3201
Introducing students to a general introduction to invertebrates with a detailed study of the organisms in the phyla of invertebrates (phylum Protozoa, phylum Cnidaria, phylum Flatworms)

Invertebrates 2: EWB3202
Completing a detailed study of the invertebrate phyla (bagworms, annelid worms, arthropods, softworms, and echinoderms).

Comparative plant anatomy: EWB3203
Introducing students to the components of the plant cell, classifying plant tissues, their structure and functions of the tissues found in the root, stem and leaves, while conducting practical experiments to dissect the plant cell to identify the living and non-living contents (cell wall, stomata, fibers and bundles).

Algology: EWB3204
Introducing the student to the taxonomic location of algae in the plant kingdom, the environmental and economic importance of algae, as well as the classification of algae in terms of external appearance, vegetative form, and methods of reproduction, while identifying some species and explaining them in detail according to their classification, structure, and reproduction.

Histology: EWB3205
Animal tissues (epithelial, connective, muscular, and nervous tissues) are studied and described in terms of their characteristics and composition, while giving an idea about the tissues of the organs (the digestive system, the respiratory system, the vascular system, the nervous system, and the urinary system), with the preparation of models that show the shapes of animal tissues, as well as identifying those tissues through models, Prepared microscopically.

Archicons: EWB3206
It gives a general idea about archaea (mosses) and their location in the plant kingdom, classifying them according to their subclasses and orders, giving examples at the genus and species level, and studying their external appearance, cellular structure, and reproduction.

Biochemistry: EWB3207
The molecular components of the cell are studied (carbohydrates, proteins, fats, nucleic acids), and the chemistry of amino acids and their types is explained, along with an explanation of enzymes and their kinetic energy, and how the enzyme works, with an explanation of the metabolic activities of sugars, proteins, and fats, as well as identification of vitamins and enzyme conjugates.

Life Statistics: EWB3208
Teaching students the most important statistical methods that are necessary to deal with for the purpose of facilitating the interpretation of research results (the mode, the median, and the standard deviation), as well as learning how to choose the appropriate statistical method such as the chi-square test, the F test, and the Z test, and how to use standard tables appropriately for each method.

Embryology: EWB3209
Studying an idea about the history of embryology and studying the theories of embryo formation, as well as how gametes are formed and eggs, with an explanation of the fertilization process (the meeting of the sperm with the egg and the embryonic stages that follow) with an explanation of the embryonic formation of spears, frogs, and birds.

Chordates and comparative anatomy: EWB3301
This course is concerned with the classification of the phyla Chordates and a comparative study of the digestive system, respiratory system, nervous system, circulatory system, reproductive system, and excretory system for each of the lizards, amphibians, reptiles, birds, and mammals, as well as a comparison between the skeletal system in fish, amphibians, and birds.

General Entomology: EWB3302

An idea is given about the science of insects, their location in the animal kingdom, their importance, and their relationship to humans and animals, as well as identifying the different families, species, and orders belonging to the arthropod phylum (insects). The external appearance of insects (cockroaches and locusts) and their general characteristics (body wall - head - tentacles) are also recognized. - Parts of the mouth - eyes - thorax - legs - wings - abdomen - digestive system - reproductive system - nervous system - circulatory system). The stages of growth and transformation in insects and their stages are also explained, and the classification of insects is also studied.

Genetics 1: EWB3303

Studying the relationship between genetics and other sciences, studying the laws of Mendelian inheritance (isolation - free distribution), clarifying what constitutes genetic material, as well as clarifying correlation, variation, genetic maps, identifying multiple alleles in genetics, and clarifying how to determine sex and some genetic diseases.

Genetics 2: EWB3304

Clarifying an idea about (cloning genetic material, genetic codes, translating genetic information, genetic mutations, quantitative inheritance, cytoplasmic inheritance, population inheritance, sex-linked traits).

Microbiology: EWB3305

Giving a general idea and introduction to microorganisms, the history of their discovery and classification, clarifying the characteristics of microorganisms (prokaryotic - eukaryotic - viruses), clarifying the most important factors that affect the growth of microorganisms and how to control them, as well as clarifying the physiology and genetics of microorganisms, as well as the effect of antibiotics on microorganisms**.**

Plant morphology: EWB3306

Clarifying a comparison between natural, artificial, and evolutionary classification of plants. It is also concerned with a comparison between garden plants and herbariums in Iraq and the world, as well as a comparison between gymnosperm and angiosperm plants, monocot and dicotyledonous plants, and identifying their characteristics**.**

Microscopic preparations: EWB3307

Explaining a number of techniques used in life sciences laboratories, such as making temporary slides and permanent slides, as well as how tissue sections are made. There is a practical aspect to clarifying how slides are made.

Applied Entomology: EWB3308

The most important harmful and beneficial insects that are related to humans, animals, plants, and the environment, which in turn have economic, medical, industrial, and agricultural importance, are identified, along with a description of the types of these insects (description of the general appearance of the insect - head and mouth parts, tentacles, legs, wings, etc.). Their

life cycle, reproduction, ways to combat harmful ones, as well as ways to benefit from beneficial ones.

Fungi: EWB3309

Explaining an overview of the history of mycology, its relationship to other sciences, and the position of fungi among living organisms, as well as clarifying the classification of fungi into their main classes, phyla, and orders, and a detailed description of examples at the genus and species level, and the taxonomic level of the species, represented by the general phenotypic description, their features, methods of reproduction, and the most important diseases that they can cause.

Plant classification: EWB3310

The beginning of the history of plant taxonomy and the eras that it passed through are clarified, as well as the relationship between plant taxonomy with other sciences, and an explanation of the most important systems that appeared in plant classification, as well as the goals of plant classification and its importance, with a comparison between the natural, artificial, and evolutionary classification of plants, as well as an explanation of the taxonomic pyramid of plants and the scientific nomenclature of plants. It also explains the climate and vegetation cover, as well as explaining the stages of development and advancement of vegetation cover, as well as clarifying the most important features and variations in plants that made them adapt to grow in their environment, and the most important factors responsible for the geographical distribution of plants, and describing the characteristics and characteristics of many plant families that are most abundant in the local environment.

Biotechnology: EWB3311

A definition is given to the term biotechnology and its relationship with other sciences and its importance to humans in various fields. Methods of dealing with living organisms used in biotechnology for the purpose of benefiting from them are also learned, as well as how to select the appropriate microorganism according to specifications that help improve the quality of production. Identifying how vaccines work and preserving good strains for use in production. The types of farms used in industrial fermenters, the types of fermenters and the conditions that must be met in the industrial fermenter are also clarified. Methods of separating the product from the rest of the contents of the industrial fermenters are also identified, and a description of the most important products that are involved is also given. It contains microorganisms in its manufacture.

Animal physiology: EWB3312

Defining animal physiology and clarifying the functions of the body's organs and the systems present in the human body, such as the digestive system, the respiratory system, the blood and lymph circulation system, the nervous system, the urinary system, and the reproductive system. The skeletal structure of the human body is also explained.

Parasitology 1: EWB3401

The types of parasitism and the relationship of the parasite to its environment are explained, as well as the relationship between the parasite and the host. A comparison is made between the different types of parasites that infect humans and animals.

Parasitology 2: EWB3402

The classification of the types of parasites and their forms (protozoa of medical importance - worms) is explained. How the parasite develops and settles in the human body and the most important diseases caused by parasites is explained.

Applied Bacteriology: EWM3403

It is concerned with clarifying the bacteria that live in a specific environment, whether in the air environment, the water environment, the soil environment, the environment of various fresh and canned foods, and bacteria of medical and industrial importance.

Ecology: EWB3404

Identifying the concept of ecology, characterizing the ecosystem and the flow of energy in it, learning about food chains and the factors determining living organisms, abiotic factors of the land environment and the water environment are also identified, groups and societies and the relationship of living organisms among them are also clarified, and technical and cultural progress and the extent of its effects on the environment are also clarified.

Plant physiology: EWB3405

It explains the relationship between plant physiology and other plant sciences, as well as clarifying water relations and diffusion (osmosis - transpiration - absorption - transport - transpiration). It also clarifies the process of photosynthesis (photosynthetic pigments - stages of the photosynthesis process - factors affecting the process of photosynthesis). The process of transporting sugars in the bark, mineral nutrition for the plant, how the germination and latency process occurs, and an introductory explanation of growth regulators and plant hormones.

Molecular Biology: EWB3406

An explanation is given to describe the structure of the DNA and RNA molecules, the nitrogenous bases that contribute to their formation, and to identify their chemical composition, as well as to identify the genetic code, the stages of protein synthesis, and the types of mutations that can occur, as well as to identify the hypotheses of cleavage of the double strand of DNA to form a new double structural strand, and to identify the types of RNA. Present in the cell as well as the genetic structure is recognized in eukaryotes and prokaryotes.

Cellular Metabolism: EWB3407

The most important metabolic processes and their pathways that can occur in the cell and the enzymes contributing to those metabolic pathways, such as the glycolysis cycle, the Krebs cycle, the oxidative phosphorylation cycle, and free energy products, are identified, as well as the metabolism of fats and proteins.

Environmental Pollution: EWB3408
It is concerned with describing the science of environmental pollution and its relationship to the effect of polluting materials on living organisms, whether humans, animals, or plants, as well as organisms that live in the water environment. The most important sources of pollution are identified, whether chemical, biological, radioactive, or thermal pollution, and what are the ways to prevent the sources of these pollutants, as well as identification. On the standard concentrations of pollutants, in which the concentrations of pollutants must not exceed the internationally permissible limit.

Immunology: EWB3409
Immunology is defined and its relationship to other sciences, as well as the main types of immunity, their divisions, and the factors affecting them, as well as the components of the cellular immune system, identification of antigens, antigenic determinants, antibodies, their types, characteristics, and theories of their formation, as well as recognition of monoclonal and complement antibodies, allergies and their types, and immunity against bacteria, parasites, and viruses, as well as recognition. On some important diseases that affect the immune system, such as AIDS.

Public Health: EWB3410
It is concerned with teaching health awareness in various areas of human life, explaining the most important diseases that can affect humans, identifying their causes and methods of transmission, and mentioning their symptoms and methods of preventing them.

Elective: EWB3411
Research is done in one of the specializations in life sciences that is prepared for selection by the student after it is announced by the department to the students.

Graduation research: EWB2403
One of the research titles announced in the department within the specializations of life sciences is chosen, and practical scientific tests are conducted, provided that the research is completed within a period of time commensurate with the period specified for it.

Teaching in the Education College for Women/Department of Biology

No.	Instructor's name	Certificate	The scientific title	Exact specialization
1	Nedhal Ibrahem Lateff	Ph.D	Assistant Professor	Histology and Physology
2	Hamdi Jassim Hammadi	Ph.D	Professor	Plant genetics
3	Abdul-Nasi Abdulla Mahdi Al-Tamimi	Ph.D	Assistant Professor	Aquatic ecology -Algae
4	Ashwaq Talib Hameed	Ph.D	Assistant Professor	Plant Taxonomy
5	Muthana Badie Farhan	Ph.D	Assistant Professor	Microbiology and molecular genetics
6	Mohammad Abbas Jasim	Ph.D	Assistant Professor	Biotechnologyand molecular biology
7	Nagam Khudhair Mahdi	Ph.D	Assistant Professor	Biochemistry and Molecular Biology
8	Muhammad Musleh Sharqi	Ph.D	Assistant Professor	Ecology and pollution
9	Hana Abdel Latif Yassin	Master's	Assistant Professor	Microbiology
10	Abeer Youssef Abdel Karim	Master's	Assistant Professor	Microbiology
11	Shaima Hajlan Sayer	Master's	Assistant Professor	Histology
12	Saja Yahya Abdul Jalil	Ph.D	lecture	Microbiology/Mycology
13	Imtithal Ismael Jaloot	Ph.D	lecture	Entomology and Ecto Parasites
14	Hebat allah Adel Abdullah	Ph.D	lecture	Mycology
15	Hadeel Abdel ah Abdel Razzaq	Ph.D	lecture	Zoology Genetics
16	Asmaa Wajeh Jumaa	Master's	lecture	Animal physiology
17	Shaimaa MoheDawd	Master's	lecture	Plant Ecology
18	Asmaa Abdulameer Bedn	Master's	lecture	Plant physiology
19	Hanan Fawzi Salman	Master's	lecture	Immune
20	Thfaf Abdullah Ahmed	Master's	assistant teacher	Parasites
21	Nbaa Mutea Abid Al-Alh	Master's	assistant teacher	Animal physiology
22	Ethar Munther Abdel	Master's	assistant	Ecology and pollution

	Wahab		teacher	
23	Khansaa Khairi Hammood	Master's	assistant teacher	Anatomy and Plant classification