Ministry of Higher Education and Scientific Research

Scientific supervision and evaluation device

Department of Quality Assurance and Academic Accreditation

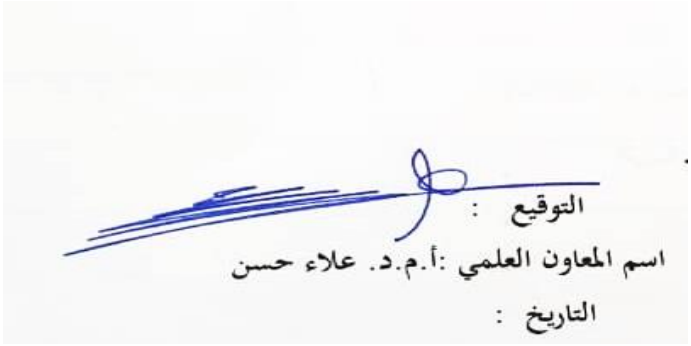
Academic program description form for colleges For the academic year 2020/2021

University: Basra

College/Institute: Sciences

Scientific Department: Life Sciences

Date of filling the file: 09/15/2021



Check the file

Division of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University Performance Division

date: **Signature** :

Description of the academic program

This academic program description provides a necessary summary of the most important characteristics of the program and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the available opportunities. It is accompanied by a description of each course within the program

1. Educational institution1	Basrah University – College of science
2. Scientific department/center	Biology Department
3. 1. Name of the academic or professional program	Biology
4. Name of the final certificate	Bachelor of Science in Life Sciences and Microbiology
5. Academic system: Annual/courses/others	Courses
6. Accredited accreditation program	Abet
7. 1. Other external influences	Many official holidays and poor laboratory equipment
8. 1. Date the description was prepared	
1. Objectives of the academic program	
1- Teaching the student the basic principles in life sciences	
2-Preparing specialists in life sciences and their practical applications, who are responsible for studying the country's need for development and progress and capable of meeting the needs of the labor market in state institutions and the	

.health, agriculture and pharmaceutical industries sectors
3- Preparing an educated generation that is armed with science and adopts it as a sound basis for bringing about radical changes and adopts scientific knowledge and the scientific method in thinking, analyzing and adapting to the development of technologies in order to keep pace with the expansion of human needs.
4- Providing an academic climate suitable for study and research, enabling the student to pursue his higher studies and contribute to finding solutions to problems using appropriate techniques.
5- Active contribution to deepening and strengthening the university's relationship with society through implementing advisory work, training, and developing teaching and administrative staff.

2-	1-Required program outcomes and teaching, learning and evaluation methods
	A- Cognitive objectives A1- Make the student able to know and understand the basics of life sciences A2- Make the student able to know and understand the practical applications of life sciences 3- The ability to use modern technologies in the field of analysis and conducting scientific research
	B - The program's skill objectives .B1 - Sound scientific research B2 - Constructive scientific discussions and expressing .opinions B3- The ability to apply the theoretical and practical experience gained from his studies in the areas of practical .life, taking into account medical restrictions
	Teaching and learning methods
1	1-Use the board and pen. 2-Presentation of lectures using Power Point. 3-Using practical study methods for students through the practical laboratories available in the department and under the supervision of the academic staff.

	4-Graduation projects.
	Evaluation methods
	1-Follow up on daily attendance 2-Conducting daily tests 3-Monthly tests 4-Final exam
1-	Program structure

Credit hours		Course Name	Type of course	Course code	Stage
Practice	Theoretic				
3	3	General Biology	Obligate dep.	B101	First
3	3	General Microbiology	Obligate dep.	B104	First
3	2	Principles of Ecology	Obligate dep.	B105	First
0	3	The Principles of Human Rights	University requirements	C101	First
0	2	General geology	Obligate college	G100	First
0	2	Computer	Obligate college	Ch 127	First
0	2	Arabic Language	University requirements	A101	First
0	2	Biostatistics	Obligate college	Math 117	First
0	1	Sport	University requirements	S101	First
3	2	Physics	Obligate college	Ph 103	First
3	2	Organic Chemistry	Obligate college	Ch112	First
0	3	Mathematics	Obligate college	MATH 101	First
3	3	Analytical Chemistry	Obligate college	Ch131	First
Second Stage					
3	3	Fundamental bacteriology	Obligate dep.	B204	Second
0	3	The Principles of Freedom and Democracy	Obligate dep.	B201	Second

3	2	Biochemistry	Obligate dep.	CH240	Second
3	3	Plant taxonomy	Obligate dep.	B210	Second
3	2	Environmental microbiology	Obligate dep.	B202	Second
3	3	Environment and plant taxonomy	Obligate dep.	B230	Second
3	3	Histology	Obligate dep.	B206	Second
0	3	Plant anatomy	Obligate dep.	B205	Second
1	0	Microscopic preparation	Obligate dep.	B207	Second
3	3	Insects	Obligate dep.	B212	Second
3	3	Invertebrates	Obligate dep.	B208	Second
3	3	Cytology	Obligate dep.	B203	Second
3	2	Computer applications	Obligate college	Co260	Second
Third stage					
0	2	English Language	University requirements	D301	Third
3	2	Genetics	Obligate dep.	B301	Third
3	2	Parasitology	Obligate dep.	B306	Third
3	2	Mycology	Obligate dep.	B311	Third
3	2	Algology	Obligate dep.	B316	Third
3	2	Animal physiology	Obligate dep.	B321	Third
3	2	Genetics of microbiology	Obligate dep.	B322	Third
3	2	Immunology	Obligate dep.	B366	Third
3	2	Emberology	Obligate dep.	B310	Third
3	2	Pollution	Obligate dep.	B376	Third
3	2	Cordata	Obligate dep.	B323	Third
3	2	Medical bacteria	Facultative dept.	B341	Third
3	2	Clinical Chemistry	Facultative dept.	Ch343	Third
3	2	Medical entomology	Facultative dept.	B362	Third
3	2	Aquatic plant	Facultative dept.	B356	Third
3	2	Aquatic ecology	Facultative dept.	B373	Third
3	2	Medical plant	Facultative dept.	B378	Third
3	2	Molecular Biology	Facultative dept.	B379	Third
3	2	Microbial pollution	Facultative dept.	B350	Third

Fourth Stage					
3	2	Plant physiology	Obligate dep.	B412	Fourth
3	2	Genetic engenering	Obligate dep.	B454	Fourth
3	2	Comparative anatomy	Obligate dep.	B424	Fourth
0	1	Research Project	Obligate dep.	B416	Fourth
0	2	Environment Awerness	University requirements	S400	Fourth
0	2	Evolution	Obligate dep.	B415	Fourth
3	2	Applied microbiology	Obligate dep.	B443	Fourth
3	2	Virology	Obligate dep.	B414	Fourth
3	2	Serology	Facultative dept.	B465	Fourth
3	2	Plant diseases	Facultative dept.	B413	Fourth
3	2	Aquatic animal physiology	Facultative dept.	B431	Fourth
3	2	Environmental ecology	Facultative dept.	B430	Fourth
3	2	Archgonate	Facultative dept.	B455	Fourth
3	2	Biotechnology	Facultative dept.	B464	Fourth
3	2	Plant tissue culture	Facultative dept.	B466	Fourth
3	2	Biological control	Facultative dept.	B468	Fourth
0	3	Fish Breeding	Facultative dept.	B470	Fourth
3	2	Hematology	Facultative dept.	B473	Fourth
3	2	Enzymes	Facultative dept.	B487	Fourth
3	2	Medical Mycology	Facultative dept	B467	Fourth

Levels	
First Level	36-0
Second Level	72-37
Third Level	108-73
Fourth Level	143-109

units for graduation	
Obligate dep.	81
Facultative dept.	27
College requirements	25
University requirements	13
Total	146

1- Planning for personal development
1-Make the student capable of his skills in laboratory group work 2-Making the student able to pass job interviews and demonstrate the academic personality required at work 3-Make the student able to pass professional and scientific tests organized by local or international bodies. 4-Making the student capable of self-development after graduation. 5-Encouraging faculty members to obtain the highest academic and administrative ranks. 6-Continuous improvement and development of faculty members through training programs and workshops.
1-Admission standard (setting regulations related to admission to the college or institute)
According to the requirements of the Ministry of Higher Education and Scientific Research (central admission)
The most important sources of information about the program
1-The curriculum approved by the Ministry of Higher Education and Scientific Research and its guidelines 2-Decisions and recommendations of the scientific committees in the college and the Life Sciences Department in particular 3-Developmental and rehabilitation courses in teaching methods. 4-Internet research for similar experiences. 5-Personal experiences of pioneering professors in the college and department

Curriculum Skills Chart

Please check the boxes corresponding to the individual learning outcomes of the program

Educational outcomes required from the program																
al and fying ble skills er skills ed to bility and onal pment			**Emotional and Value goals**				**Skills objectives of the program**				**Cognitive objectives**				**Basic or facultative**	**Course Name**	**Cours code**
	D 2	**D1**	**C 4**	**C3**	**C2**	**C1**	**B4**	**B3**	**B2**	**B1**	**A4**	**A3**	**A2**	**A1**			
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	General Biology	B101
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	General Microbiology	B104
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Principles of Ecology	B105
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	The Principles of Human Rights	C101
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	General geology	G100
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Computer	Ch 12
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Arabic Language	A101
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Biostatistics	Math 117
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Sport	S101
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Physics	Ph 10
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Organic Chemistry	Ch11
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Mathematics	MATH 101
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Analytical Chemistry	Ch13
	√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Fundamental bacteriology	B204

√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	The Principles of Freedom and Democracy	B201
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Biochemistry	CH24
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Plant taxonomy	B210
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Environment and plant taxonomy	B230
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Histology	B206
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Plant anatomy	B205
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Microscopic preparation	B207
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Insects	B212
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Invertebrates	B208
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Cytology	B203
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Computer applications	Co26
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Environmental microbiology	B202
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	English Language	D301
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Genetics	B301
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Parasitology	B306
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Mycology	B311
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Algology	B316
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Animal physiology	B321
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Genetics of microbiology	B322
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Immunology	B366
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Emberology	B310
√	√		√	√	√	√	√	√	√	√	√	√	√	**Basic**	Pollution	B376
√	√		√	√	√	√	√	√	√	√	√	√	√	**Facultative**	Cordata	B323
√	√		√	√	√	√	√	√	√	√	√	√	√	**Facultat**	Medical bacteria	B341

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√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Clinical Chemistry	Ch34
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Medical entomology	B362
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Aquatic plant	B356
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Aquatic ecology	B373
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Medical plant	B378
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Molecular biology	B379
√	√		√	√	√	√	√	√	√	√	√	√	Basic	Plant physiology	B412
√	√		√	√	√	√	√	√	√	√	√	√	Basic	Genetic engenering	B454
√	√		√	√	√	√	√	√	√	√	√	√	Basic	Comparative anatomy	B424
√	√		√	√	√	√	√	√	√	√	√	√	Basic	Research Project	B416
√	√		√	√	√	√	√	√	√	√	√	√	Basic	Environment Awerness	S400
√	√		√	√	√	√	√	√	√	√	√	√	Basic	Evolution	B415
√	√		√	√	√	√	√	√	√	√	√	√	Basic	Applied microbiology	B443
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Virology	B414
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Serology	B465
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Plant diseases	B413
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Aquatic animal physiology	B431
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Environmental ecology	B430
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Archgonate	B455
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Biotechnology	B464
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Plant tissue culture	B466
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Biological control	B468
√	√		√	√	√	√	√	√	√	√	√	√	Facultative	Fish Breeding	B470

√	√		√	√	√	√	√	√	√	√	√	√	√	**Facultative**	Hematology	B473
√	√		√	√	√	√	√	√	√	√	√	√	√	**Facultative**	Enzymes	B487
√	√		√	√	√	√	√	√	√	√	√	√	√	**facultative**	Fungi physiology	B486
√	√		√	√	√	√	√	√	√	√	√	√	√	**facultative**	Medical mycology	B467

First Stage/General biology B101

Course Description Form

Study animal and plant organism, it gives information about animal and plant tissues. Impotent of form and function of cells such as cell membrane, cytoplasm, nucleus, Golgi bodies, lysosomes, mitochondria, cytoskeleton. Some systems such as nervous, digestive, skeletal, circulatory systems were studied. As well as nutrition and gas exchange. The mechanism of water and molecules movement across plasma membrane, Internal structure of the plant organs and plant tissues as well as studies .Plant diversity of algae, of fungi, bryophytes, pteridophytes, Gymnosperms and angiosperms

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Name/code of the course	General biology B101
4. Attendance Form Available	Weekly
5. Semester/ Year	2021-2020

6. Total of study hours	3 hours of theory + 2 practical hours
7. The course description was	1-9-2021

9. Aims of the Course

Is to know and define the biology also Its parts and kinds of biology. The study the classification of organisms also studies and their structures, in addition function of their systems

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

1- Is to know and define the biology
2- Its parts and kinds of biology
3- Study the classification of organisms
4- Study their structures
5- Study the function of their systems

b- Skill objectives for the course

1.To do different laboratory analysis in animal and plant structure.
2. To diagnosis all types of layers.
3. Anatomy the animal and plants organelles

Teaching and learning methods

1. Explanation and Discussion of the Lectures
2. boosting the student to make reports, and power point presentation.

Evaluation methods

1- Daily test and reports
2- Monthly exams and final exams.

C- Emotional and value goals

Training the student to use different apparatus in the laboratory and develop research capacities to the students.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

1. Developing the skills mental abilities of the student
2. Dealing with laboratory work.

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning	Hours	Week

			outcome		
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	animal cell and tissues Form and functions. Cell membrane, cytoplasm, neoclus, golgi bodies, lysosomes, mitochondria, cytoskeleton	Student understanding of the lesson	3 h. lect. 3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Integument system Protection: Support and movement Integument of invertebrates, the skin of cartilaginous fishes, bony fish, amphibians , human.	Student understanding of the lesson	3 h. lect. 3h. lab	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Skeletal system : The skeletal system of invertebrates hydrostatic, exostatic,and endostatic) Skeletal system of vertebrates (cartilage, bone,) muscles	Student understanding of the lesson	3 h. lect. 3h. lab	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Circulation system and gas exchange .	Student understanding of the lesson	3 h. lect. 3h. lab	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Concept, transport system of invertebrates, open system,	Student understanding of the lesson	3 h. lect. 3h. lab	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Vertebrates, close system , blood, vein and artery , circulatory system of various vertebrates.	Student understanding of the lesson	3 h. lect. 3h. lab	6
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Nutrition and digestion system. Diversity in digestive, invertebrates, and vertebrates, Structures of vertebrate's digestive systems	Student understanding of the lesson	3 h. lect. 3h. lab	7
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Fluid osmosis in animals.	Student understanding of the lesson	3 h. lect. 3h. lab	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Plant cell wall mechanism of water and molecules movement across plasma membrane. Also, plant cell content and Classification of plant tissue.	Student understanding of the lesson	3 h. lect. 3h. lab	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Meristematic, permanent tissues and Conductivity tissues in plants	Student understanding of the lesson	3 h. lect. 3h. lab	10
Daily and	Theoretical and practical	Plant tissue: Internal structure of the plant	Student	3 h. lect.	11

monthly tests	lectures Use of educational aids, presentations and scientific films Practical application	organs.	understanding of the lesson	3h. lab	
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	plant diversity of bryophytes and Pteridophytes.	Student understanding of the lesson	3 h. lect. 3h. lab	12
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	The algae and fungi	Student understanding of the lesson	3 h. lect. 3h. lab	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Gymnosperms and angiosperms	Student understanding of the lesson	3 h. lect. 3h. lab	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Plant cytology and Ecology	Student understanding of the lesson	3 h. lect. 3h. lab	15

11- Infrastructure	
Biology	Required course books: * * * * *
zoology miller and Harley 200 [1] Campbell, et al. 2008 lectures power points [2] vedio in biology lectures [3]	Main references (sources):
	Books and references that he recommends (scientific journals, reports……) - - -
http://wilkibooks. www.Jairr.com https://openstax.org/books/biology-2e/pages/1-2-themes-and-concepts-of-biology www.damastagate.com	Electronic references website

12. Course Development Plan

Depending on modern references and books.
Scientific trips in field.
Using and training of different lab apparatus.

First Stage/ Principles of Ecology (B105)

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Principles of Ecology (B105)

4. Attendance Form Available	Weekly
5. Semester/ Year	2020-2021
6. Total of study hours	Two hours of theory +one practical hour
7. The course description was	prepared in 15/9/2021

8. Aims of the Course

Enabling the student to identify the principles of ecology, including the components of the ecosystem, population ecology and the community ecology , from both the theoretical and practical perspectives .

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

Academic objectives of the course "PRINCIPLES OF ECOLOGY (B105)" concerning with the understanding of the followings:

a.1. The living and non-living components of an ecosystem , ecosystem development , functions of the ecosystem ,biogeochemical cycles , energy flow and trophic structure , and the limiting factors and tolerance levels.
a.2. Population ecology (structural and functional characteristics of the population and inter-specific relationships)
a.3. Community ecology (structural and functional characteristics of the biotic communities) and the major terrestrial biotic communities (the biomes).
a.4. Laboratory methods and instruments used to measure the main physical and chemical variables that affect an ecosystem.

b- Subjective- Specific Skills

b.1.Gaining theoretical experience in the principles of ecology to explain and philosophy of environmental phenomena
2- Gaining theoretical and practical experience to measure the physical and chemical variables affecting the ecosystem

Teaching and learning methods

1.Theoretical and practical lectures

2.Use of educational aids (presentations and scientific films)

3- Practical application (laboratory works)

Evaluation methods

1- Daily test and reports

2- Monthly exams

2- Final exams

C- Emotional and evolutional goals

1. To make the students believe that ecosystems are unique life formations in all their Physical, chemical and biological aspects, so education must be made to preserve and protect it

2. Directing students to protect the environment, as the protection of biodiversity on the planet Earth is everyone's responsibility.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

1. Developing the mental abilities of the student

2. Developing the skills

3. Dealing with field and laboratory

10- The structure of the course					
Week	**Hours**	**Unit name / course or topic**	**Required learning outcomes**	**Learning method**	**Evaluation method**
1 st week,	**2 h. lect. 2h. lab.**	**Theoretical: 1: Ecosystem 1-1: Principles of ecosystem Definitions of essential terms (Population , Community ,Environment &Habitat ,Ecosystem ,Biosphere) Practical: A : Physical parameters: Temperature : Part 1**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
2nd week,	**2 h. lect. 2h. lab.**	**Theoretical: Components of the ecosystem Abiotic substances Producer organisms , Consumer organisms , Decomposer organisms Incomplete ecosystems , Ecosystem development practical: Temperature : Part 2**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
3rd week,	**2 h. lect. 2h. lab.**	**Theoretical: 1-2: Functions of the ecosystem (Basic features of Production , Consumption and Decomposition) Production and productivity (Photosynthesis , Chemosynthesis , Productivity Practical: Humidity : Part 1**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
4th week,	**2 h. lect. 2h. lab.**	**Theoretical: Consumption, Decomposition Practical: Humidity : Part 2**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
5 th week,	**2 h. lect. 2h. lab.**	**Theoretical: 1-3 :Biogeochemical cycles and Ecosystem homeostasis . Carbon cycle , Nitrogen cycle, Practical: Light: Part 1**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
6th week,	**2 h. lect. 2h. lab.**	**Theoretical: Phosphorus cycle , Sulfur cycle ,Ecosystem homeostasis Practical: Light: Part 2**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**

7th week,	**2 h. lect. 2h. lab.**	**First examination**	**---------**	**----------**	**---------**
8th week,	**2 h. lect. 2h. lab.**	**Theoretical: 1-4: Energy flow and trophic structure The source of energy , Food chains and trophic structure,Trophic structure and ecosystem stability. Ecological pyramids, Ecological efficiencies Practical : Weather: Part 1**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
9th week,	**2 h. lect. 2h. lab.**	**Theoretical: 1-5: Limiting factors and tolerance levels Shelford's and Liebig's laws Indicator organisms Practical : Weather: Part 2**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
10th week,	**2 h. lect. 2h. lab.**	**Theoretical: 2: Population ecology 2-1: Structure of single species populations Population sizes , Spatial distribution , Sex ratios , Age structures & Life tables Practical : Weather: Part 3**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
11th week,	**2 h. lect. 2h. lab.**	**Theoretical: Population growth , Population fluctuations Practical : B: Chemical parameters (Water quality Parameters): pH, Dissolved oxygen**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**
12th week,	**2 h. lect. 2h. lab.**	**Theoretical: 2-2: Interspecific populations (two species population interactions) Commensalism , Mutualism , Predation , Parasitism , Competition , Amensalism and Antibiosis Practical : Alkalinity, Hardness**	**Understanding of lectures**	**Use of educational aids (presentations and scientific films)**	**Daily and monthly tests**

13th week,	**2 h. lect.** **2h. lab.**	**Theoretical:** **3: Community ecology** **3-1: Principles of community**	**Understanding of lectures**	**Use of educational aids**	**Daily and monthly tests**
11. Infrastructure					
		Conductivity , Salinity			
1- Textbooks required for the course			**Southwick, C.H. (1976) . Ecology and the quality of our environment, second edition, New York : D. Van Nostrand, 426 pages**		
	2h. lab.				
15th week,	**2 h. lect.** **2h. lab.**	**Theoretical:** **Human Activities and their**			
2 References			**Cunningham,W.P ; Cunningham,M.A and Saigo,B.W. (2007) : Environmental science a global concern , ninth edition , Mc**		
		Nutrients (Nitrates &Phosphates)			

	Graw-Hill campanies,620 pages. **Peter Castro and Michael E. Huber, (2008) . Marine Biology, seventh Edition,** **Mc Graw-Hill campanies ,265 pages.**
Recommended readings	**Lewis, R. Gaffin, D. Hoefnageles, M. and Parker, B.,(2004). Life ,fifth edition.** **Mc Graw-Hill campanies,981 pages.**
Electronic website	**Personal YouTube lectures' Channel** https://www.youtube.com/channel/UCemx_NAHRRIMiodFpVsAMfg

12- Curriculum development plan

Course development based on recent versions of books and references..
The adoption of modern interactive teaching methods.
Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

B205 – plant anatomy- second Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Plant anatomy – B205**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2020-2021**
6. Total of study hours	**Two hours of theory +one practical hour**
7. The course description was	**1-9-2021**

8. Aims of the Course

1-Defining the types of plant tissues that make up the plant body .

2- learn about the specification and function of each tissue .

3- Introducing the modification that occure in plants when they exposed to unsuitable conditions .

4- Knowing the relationship between the plant and its environment anatomically

9.Course outcomes and methods of teaching, learning and assessment
a- Knowledge and Understanding goals Recognize the types and functions of plant tissue
b- Skill objectives for the course Acquisition of plant tissues diagnosis skills And how can to prepare **plant tissues sections**
Teaching and learning methods Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application
Evaluation methods Theoretical, semester and final exams
C- Emotional and value goals The ability to communicate information after collecting and promising data Linking information to physiological functions in plant body
D- Transferred general and rehabilitative skills (other skills related to employability and personal development) Developing the mental abilities of the student

10- The structure of the course					
Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	**The plant cell wall**	Student understanding of the lesson	2 h. lect. 3h. lab.	1

	presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Components of the plant cell**	Student understanding of the lesson	2 h. lect. 3h. lab.	**2**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**The plant tissues**	Student understanding of the lesson	2 h. lect. 3h. lab.	**3**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Types of plant tissues**	Student understanding of the lesson	2 h. lect. 3h. lab.	**4**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Dermal tissue system**	Student understanding of the lesson	2 h. lect. 3h. lab.	**5**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Ground tussue system	Student understanding of the lesson	2 h. lect. 3h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Vascular tissue system**	Student understanding of the lesson	2 h. lect. 3h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures	Internal structure of the root	Student understanding of the lesson	2 h. lect. 3h. lab.	**8**

	Use of educational aids, presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Internal structure of the stem and leaf	Student understanding of the lesson	2 h. lect. 3h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	The relationship of the internal structure of the plant body with its environment	Student understanding of the lesson	2 h. lect. 3h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	EXAM 1	Student understanding of the lesson	2 h. lect. 3h. lab.	11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Secretory tissue in the plant body	Student understanding of the lesson	2 h. lect. 3h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Vascular cambium and secondary growth	Student understanding of the lesson	2 h. lect. 3h. lab.	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	secondary growth in stem and root	Student understanding of the lesson	2 h. lect. 3h. lab.	15
Daily and	Theoretical and	Exam 2	Student understanding of the	2 h. lect.	16

monthly tests	practical lectures Use of educational aids, presentations and scientific films Practical application		lesson	3h. lab.	
					17
					18
					19
					20
					21
					22
					23
					24
					25
					26
					27
					28
					29
					30

11- Infrastructure	
•Plant anatomy •	Required course books: * * * * *

• **Anatomy of plant body**	**Main references (sources)-** **-** **-**
	Books and references that he recommends (scientific journals, reports……)- **-** **-**
	Electronic references, websites- **-** **-**

12- Curriculum development plan
Implicit addition of new information within the main course contexts

B203 – Cytology- Second Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Cytology –B203**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2021-2020**
6. Total of study hours	**Three hours of theory +one practical hour**
7. The course description was	**1-9-2021**

8. Aims of the Course

This part aimed to develop the ability of students to diagnosed variable Cells in the tissue sections microscopically .

To visualize differentially identify microscopic structures. It is very essential tool in anatomy, pathology and by examining sections this give diagnostic information based according the observations.

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

Recognize the types of fungi and taxonomy

b- Skill objectives for the course

Acquisition of Cytological diagnosis cells

Control of its transmission routesprevention
Teaching and learning methods **Theoretical and practical lectures** **Use of educational aids, presentations and scientific films** **Practical application**
Evaluation methods **Theoretical, semester and final exams**
C- Emotional and value goals **The ability to communicate information after collecting and promising data** **Linking information to human health and psychological reality** **Preserve the wealth**
D- Transferred general and rehabilitative skills (other skills related to employability and personal development) **Developing the mental abilities of the student** **Knowing the health reality**

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Cytology definition Cell definition Introduction of Cell	Student understanding of the lesson	3 h. lect. 3h. lab.	1
Daily and	Theoretical and	1- Classification of Cells- Prokaryotes and	Student understanding of the	3 h. lect.	2

monthly tests	practical lectures Use of educational aids, presentations and scientific films Practical application	Eukaryotes. - Prokaryotic cells - Eukaryotic cells	lesson	3h. lab.	
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Animal cells - Cell Fractionation	Student understanding of the lesson	3 h. lect. 3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Cellular Organization	Student understanding of the lesson	3 h. lect. 3h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Cytoskeletone	Student understanding of the lesson	3 h. lect. 3h. lab.	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Movement Of Molecules into and Out Of Cells - Transport of Ions	Student understanding of the lesson	3 h. lect. 3h. lab.	6
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films	Endocytosis and Exocytosis	Student understanding of the lesson	3 h. lect. 3h. lab.	7

	Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Prokaryotic Chromosomes and cell division -Eukaryotic Chromosomes and cell division	Student understanding of the lesson	3 h. lect. 3h. lab.	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Cell structure and Function Eukaryotic Cell Organelles	Student understanding of the lesson	3 h. lect. 3h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Membrane Structure and Function	Student understanding of the lesson	3 h. lect. 3h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Cell Cycle - Cytokinesis in Animal Cells	Student understanding of the lesson	3 h. lect. 3h. lab.	11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	- Cell Reproduction : Meiosis	Student understanding of the lesson	3 h. lect. 3h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	- EXAM	Student understanding of the lesson	3 h. lect. 3h. lab.	14

	presentations and scientific films **Practical application**				
Daily and monthly tests	**Theoretical and practical lectures** **Use of educational aids, presentations and scientific films** **Practical**	-	**Student understanding of the lesson**	**2 h. lect.** **3h. lab.**	**15**
					17
					18
					19
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					28
					29
					30

11- Infrastructure	
1- **Human Biology: Sylvia S. Mader, 2006**	**Required course books: ***

2- Junqueira's Basic Histology TEXT AND ATLAS , Anthony L. Mescher, PhD, 2018 **3- Cell Biology , David Priscot** **3- Lectures power points**	* * * *
	Main references (sources)- - -
	Books and references that he recommends (scientific journals, reports.....)- - -
	Electronic references, websites- - -

12- Curriculum development plan **Implicit addition of new information within the main course contexts** **Add new registered fungi**

Second Stage/ Fundamental of bacteriology B204

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Fundamental of bacteriology
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2020-2021
7. Total of study hours	45 hours + 60 practical hours
8. The course description was	prepared in 01/09/2021

9. Aims of the Course

Develop the student's knowledge about the bacteria and who to distinguish them from other organism, the structure of bacteria including the external and internal and the difference between these structure in gram positive and negative bacteria the move to the physical and chemical factors that influence the growth of bacteria and who to cultivate bacteria. The generation time for bacteria growth also consider in the course and then how to control on microbial growth by antibiotics or sterilization and the give a survey on the most abundance medically important bacteria.

10.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Recognize the types of three domain's including bacteria
a.2. How the microbial world start and then developed by mention some of experiment by scientist.
a.3. To develop the ability of the students to identify the bacterial structure.
a.4. To Identify the physical and chemical such as temperature, pH and nutritional factors that effect on bacterial growth
a.5. Identify the sustainability topics and management of bacterial dynamics of bacterial growth curve.
a.6. To how to control on bacterial contamination or infection by sterilization or antiobiotics
a.7. Some information about the most frequent bacteria in the nature and in the clinical.
.

b- Subjective- Specific Skills

b.1.Recognize how to isolate and identify bacteria.
b.2. Acquiring the skills of calculating the generation time of bacteria
b.3. Identify and understanding of sustainability methods and how to achieve them.

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Doing a short exam during the lecture.

Evaluating Methods

1- Daily test and reports
2- Monthly exams
2- Final exams

C- Emotional and evolutional goals

1. The ability to isolation and identification of bacteria from different sources.
2. Linking knowledge with the environmental and clinical isolates.

Learning Methods
1. Explanation and Discussion of the Lectures 2. Boosting the student to conduct research and reports. 3. Doing a short exam during the lecture.
d- General qualification skills transferred (other skills related to employability and personality development) 1. Developing the mental abilities of the student 2. Developing the skills 3. Dealing with field and laboratory 4. Monitoring and evaluating the isolation and identification of bacteria.

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

1. Sequencing of course content

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**3 h. lect. 2h. lab.**	Theoretical: General introduction on the microorganism, the three domins of organisms, the difference between the three domins historical introduction and how the microbial world has been developed through the experiment of Louis Pasteur and Robert Koch and others. Practical: Introduction about how to use microscope, the oil immersion lens and sterilization	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**3 h. lect. 2h. lab.**	Theoretical: The external structure of bacteria including the cell wall, plasma membrane, DNA, ribosomes, …… reaching to some exclusive structure such as capsule and spore. practical: culture media and different methods to isolate bacteria from different sources	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**3 h. lect. 2h. lab.**	Theoretical: The factors that effect on bacterial growth starting temperature, pH, Water availability, oxygen and then the nutritional requirement such as carbon, nitrogen, phosphorus …….. etc The growth curve of bacteria and to calculate the generation time of bacterial	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

		growth. Practical: Starting the identification methods such as simple and gram staining.			
9 th week, and 10th weeks	**3 h. lect. 2h. lab.**	Theoretical: Studying the genetics information transferring from the parent to daughter bacterial cell and between bacteria from the same or different species. Practical: Using differential staining to identify special structure in some bacteria such as spore and capsule staining.	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week, and 12th weeks	**3 h. lect. 2h. lab.**	Theoretical: How to control on microbial growth by sterilization and antibiotics Practical: studying the bacterial movement by some experiments	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
13 th week,	**3 h. lect. 2h. lab.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**3 h. lect. 2h. lab.**	Theoretical: Survey on most important bacteria groups for human Practical : Practical semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure	
1- Textbooks required for the course	Prepared lectures by the course leader depending on the refernces below:

2 References	1- Microbiology and bacteriology, the world of microbes, 2006, file internet. 2- Microbiology , wikipedia , the free encyclopedia ,2007. en-wikipedia-org/wiki/microbiology 3- Todar's online Text book of Bacteriology . Kenneth Todar, 2004. 4- Microbiology , Ahuman perspective / Eugene . W Nester et al. 3rd-ed 2001. 5- Microbiolog : Robert W- Bawman. 2004.
Recommended readings	Prepared lectures by the course leader depending on the above refernces
Electronic website	**American Society for Microbiology (ASM)** http://www.asmusa.org/ **Centers for Disease Control and Prevention (CDC)** http://www.cdc.gov/ **The CDC Prevention Guidelines Database** http://aepo-xdv-www.epo.cdc.gov/wonder/PrevGuid/PrevGuid.htm /

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

Plant classification B 210

This course description provides a necessary summary of the most important characteristics of the course and the learning outcomes that the student is expected to achieve, demonstrating whether he has made the most of the learning opportunities available. It must be linked to the program description.

Scientific Department/Center -2

Life science

Course name/code -3

Plant classification B 210

Available attendance forms -4

Is mandatory

Semester/Year -5

The first 2020-2021

Number of study hours (total) - 6

Two hours a week

Date this description was prepared -7

9/15/2023

Course objectives -8

• Identify the most important taxonomic terms for flowering plants

• Knowing the names of flower families and their genera

• Focus on the diagnostic characteristics of each flower family

Required program outcomes and methods of teaching, learning and evaluation - 9

A- Cognitive objectives

o The ability to classify and diagnose flower families

o Knowing the scientific names of the most important plant species

B- The skills objectives of the course

• A series of lectures to introduce the course objectives

Teaching and learning methods

• Use ppt lectures for clarification

• Use illustrations

Evaluation methods

• Monthly exams, two exams for the course

• Short and quick exams

• Discussing with students through oral questions

C- Emotional and value-based goals

o Identify the importance of flowering plants and their role in different fields

Teaching and learning methods

• Question and answer

• Explanation of lectures

• Discussion

Evaluation methods

• Exams

• Oral questions

• Student participation

D- General and rehabilitative transferable skills

o Clarifying and explaining the role of flowering plants in the Iraqi environment

Course description form for the academic year 2022-2023

Course Structure -10

the week

hours

Required learning outcomes

Name of the unit/course or subject

Learning method

Evaluation method

1

2

Introduction to taxonomy

Explanation of the most important taxonomic terms

Lectures

Questions

2

2

Study of vegetative traits

Study of stems and roots

Lectures

Questions and discussion

3

2

Study of leaves and flower squares

Study of simple papers and compound papers

Lectures

Questions

4

2

Study of the female reproductive system in flowers

Study of the pestle, pen, and stigma

Lectures

Questions

5

2

Study of the male organ in Al-Azhar

Study of stamens, bracts, kinglets and their types

Lectures

Questions

6

2

Study of flower inflorescences

Limited and unlimited lights

Lectures

Questions

7

2

First month exam

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8

2

Study of fruits

Simple fruits and compound fruits

Lectures

Questions

9

2

Study of the pollination process and reproductive systems

Self-pollination and cross-pollination in flowers

Lectures

Questions

10

2

Evolution of reproductive systems

Development of stamens and pistils

Lectures

Questions

11

2

Floral classification systems

Artificial, natural and evolutionary system

Lectures

Questions

12

2

Laws of scientific naming of plants and herbaria

Scientific names of species and genera

Lectures

Questions

13

2

Study of dicotyledonous flower families

Examples of different families with their diagnostic characteristics

Lectures

Questions

14

2

Study of monocot families

Various examples with their diagnostic characteristics

Lectures

Questions

15

2

Second month exam

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Tactical structure -11

Required prescribed books

Books:

• Plant taxonomy

Main references (sources)

Vascular plant systematic

Recommended books and references (scientific journals, reports,...)

Electronic references, websites

All websites related to plant taxonomy

Course development plan -12

Conducting field trips to different areas to identify flower families and collect plant samples directly from the field and diagnose them.

Microscopic preparations B207 - second Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	**microscopic preparations B207**
4. Attendance Form Available	Weekly
5. Semester/ Year	2022-2021
6. Total of study hours	30 practical hours
7. The course description was	1-9-2022
8. Aims of the Course	
The aim for this course is to improve the microscopy skills of students and	

researchers who have already used a microscope to acquire digital images of samples

9. Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

.

1- Identifying different lab preparations methods.
2- Identifying different microscopes types and measurements.
3- identifying different samples preparations.
4- identifying different cells preparations.
5- identifying different tissues preparations

b- Subjective- Specific Skills

b.1.To do different laboratory analysis in microscopic preparations .
b.2.use the microscope and its measurements.
b.3..identifying the lab tools and instruments.

Learning Methods

1. Explanation and Discussion of the Lectures
2. boosting the student to make reports, and power point presentation .

Evaluating Methods

1- Daily test and reports
2- Monthly exams and final exam .

C- Emotional and evolutional goals

Training the student to use different apparatus in the laboratory and develop research capacities to the students.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the skills mental abilities of the student
2. Dealing with laboratory work.

10- The structure of the course					
Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	practical: general introductions	Student understanding of the lesson	3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	practical: microscopes types, uses differences , pictures mesurments , stage and preparations and objective preparations	Student understanding of the lesson	3h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	practical: microscopes types, uses differences , pictures mesurments , stage and preparations and objective preparations	Student understanding of the lesson	3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Practical: Microtomes , types differences and uses	Student understanding of the lesson	3h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Practical: Microtomes , types differences and uses	Student understanding of the lesson	3h. lab.	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Practical: sectioning preparations ,.	Student understanding of the lesson	3h. lab.	6
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Practical: Sectioning preparations .	Student understanding of the lesson	3h. lab.	7

Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Practical: semester exam	Student understanding of the lesson	3h. lab.	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	. Practical : Fixative and staining methods	Student understanding of the lesson	. 3h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Types of microscopic preparations	Student understanding of the lesson	. 3h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Types of microscopic preparations	Student understanding of the lesson	3h. lab.	11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Blood samples preparations	Student understanding of the lesson	. 3h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Exam	Student understanding of the lesson	. 3h. lab.	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application		Student understanding of the lesson	3h. lab.	15
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application		Student understanding of the lesson	. 3h. lab.	16
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12. Course Development Plan
Depending on modern references and books . Scientific trips to laboratories and hospitals . Using and training of different lab apparatus .

11- Infrastructure	
1- Textbooks required for the course	-
2 References	Functional microscopic preparations
Recommended readings	https://fac.ksu.edu.sa/sites/default/files/lthdyrt_lmjhry_ljz_lthny.pdf
Electronic website	http://wilkibooks.

Second Stage/ Histology B206

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.**Educational Institution**	College of Science/ University of Basrah

2. **Department**	Biology
3. **Course name/Code of the course**	Histology B206
4. **Programs included in**	Bachelor's, Master's, Doctorate
5. **Attendance Form Available**	Weekly
6. Semester/ Year	2020-2021
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/09/2023

9. **Aims of the Course**

Develop the student's ability to recognize the importance of tissues types , their development , and classification, structure and functions importance. As well as recognize the most methods and practical methods to diagnose the abnormal changes and the agents affecting on it, also diagnosing the basic tissues that form the organs and system.

11. Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Recognize the types of basic tissues in the human body .
a.2. Recognize the structure of basic tissue in the different system .
a.3. To develop the ability of the students to identify the normal identification of body tissues.
a.4. To Identify the main functions and their relation to resources.
a.5. Identify the pathogens associated with tissues abnormalities.
a.6. To understand the ultrastructure , chemical and physiological properties of variable tissues.
.

b- Subjective- Specific Skills for the course

b.1.Recognize the classification of tissues in our body by laboratory examination.

b.2. summarized the suitable technique to examining types of tissues.

b.3. Determined the most suitable methods to study the tissues.

c- Teaching and Learning Methods

1. Explanation and Discussion of the theory and practical Lectures.
2. It is boosting the student to conduct researches and reports.
3. Urging the students to make PowerPoint presentations.

d- Evaluating Methods

1- Daily test and reports

2- Monthly exams

2- Semester and Final exams

e - Emotional and values goals

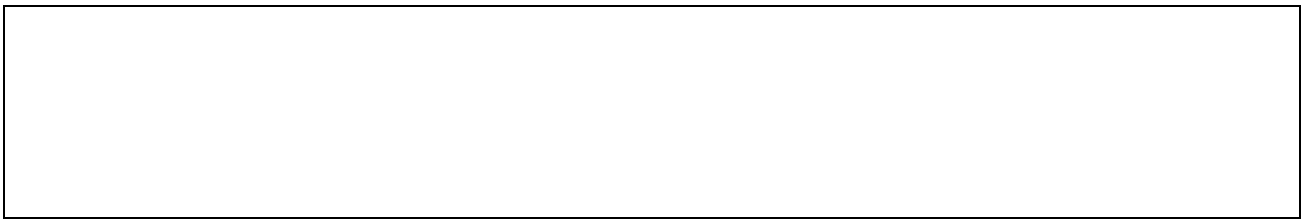
1. The ability to recognize the importance of histology science in our life and health.
2. Linking knowledge to understand the pathogenesis of diseases.

Learning Methods

1. Explanation and Discussion of the Lectures
2. Boosting the student to conduct research and reports.
3. The student PowerPoint presentations.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the mental abilities of the student by new ideas to diagnosed and examination.
2. Developing the skills
3. Dealing with hospitals and laboratory work.
4. Practical study to prepared some slides and examined by students.



This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

2. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Theoretical: General introduction, definition of cells organelles, their, benefits, presence, distribution and main function. Practical: Studying the microscope structures . main parts and how work.	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work to laboratory.**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	Theoretical: Epithelial tissues, classification, functions, connective tissues, bone, cartilage practical: examining types of epithelial tissues	**Knowledge and understanding of lectures**	**Lectures and discussion**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	Theoretical: Muscular system, nervous system Practical: Explain types of muscle, nerve cells	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work.**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	Theoretical: Circulatory system, heart ,lymphatic system Practical: Explain types of blood vessels, lymphoid organs	**Knowledge and understanding of lectures**	**Understand the lectures and discussion**	**Daily and monthly tests**
11 th week, and 12th weeks	**2 h. lect. 2h. lab.**	Theoretical: Integument system, hair, glands Practical: Explain the hair	**Knowledge and understanding of lectures**	**Understand the lectures and discuss with students**	**Daily and monthly tests**

		structure, nail and skin glands			
13 th week,	**2 h. lect. 2h. lab.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Theoretical: Kidney structure, ureter, urinary bladder Practical : Practical semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work in the laboratory**	**Daily and monthly tests**

1- Textbooks required for the course	

2 References	**1- Junqueira's Basic Histology TEXT AND ATLAS , Anthony L . Mescher, PhD, 2018** **2- Junqueira's Basic Histology: Text & Atlas,2016** **3-Lectures power points**
Electronic website	https://www.scopus.com/authid/detail.uri?authorId=57214320190 **https://scholar.google.com/citations?user=G3yGAagAAAAJ&hl=ar**

12. Curriculum development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

B202 – environmental microbiology- tow Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Environmental microbiology B202**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2022-2021**
6. Total of study hours	**Two hours of theory +Two practical hour**
7. The course description was	**1-9-2022**

8. Aims of the Course

-Raising students' scientific and practical skills

-Introduce students to the environments of microorganisms, their presence and isolation

-Develop practical study skills and link them to theoretical foundations

- Supplementing the department's need of scientific competencies and the relevant authorities with scientific cadres with experience

-Responding to the requirements of the labor market, community service and solving related problems

- Conducting laboratory experiments to teach students isolate microorganisms and study the transformations of elements in nature that occur as a result of the activities of these microorganisms

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

1- study the important vocabulary in various biological fields of microbiology of bacteria, fungi and viruses, their role in the environment in which they inhabit

2- the effects of microorganisms show in the environment, and their use as degradable for different pollutant

3- experiment of isolation the microorganisms from different environments

4- study the transformation of metals through the scientific laboratory experiment

5- consequence effects of transformation of metals by microorganisms on environments and human

b- Skill objectives for the course

b.1.isolation and enumeration of microorganisms from different environments

b.2 biological treatment methods using modern and environmentally friendly techniques

b.3. Identify and understanding of metal transformation and how to benefit of them

Teaching and learning methods

Theoretical and practical lectures

Use of presentations and scientific films

Practical experiments

Evaluation methods

Theoretical, semester and final exams

C- Emotional and value goals

1. The ability to isolates of different microorganisms and their importance in earth ecosystem.

2. Linking the role of microorganisms to Phenomena related to the environments.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

1.evalution the role of microorganisms in different environments for environmental problem solving

2. Developing the skills of students

3. Dealing with field and laboratory experiments

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	scientific terms part one	Student understanding of the lesson	2 h. lect. 2h. lab.	1
Daily and	Theoretical and	scientific terms part two	Student understanding of the	2 h. lect.	2

monthly tests	practical lectures Use of educational aids, presentations and scientific films Practical application		lesson	2h. lab.	
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Microbial ecology	Student understanding of the lesson	2 h. lect. 2h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Presence of microorganisms in different environment Soil environment	Student understanding of the lesson	2 h. lect. 2h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Water environment	Student understanding of the lesson	2 h. lect. 2h. lab.	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Air environment	Student understanding of the lesson	2 h. lect. 2h. lab.	6
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Extreme environment	Student understanding of the lesson	2 h. lect. 2h. lab.	7
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films	Biogeochemical cycle Carbon cycle	Student understanding of the lesson	2 h. lect. 2h. lab.	8

	Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Nitrogen cycle	Student understanding of the lesson	2 h. lect. 2h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Sulfur cycle	Student understanding of the lesson	2 h. lect. 2h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Phosphorous and iron cycle	Student understanding of the lesson	2 h. lect. 2h. lab.	11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Consequence of biogeochemical cycle	Student understanding of the lesson	2 h. lect. 2h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Bioremediation	Student understanding of the lesson	2 h. lect. 2h. lab.	14
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					30

11- Infrastructure	
books: **1- environmental Microbiology** **2- microorganisms of soil**	**Required course books: *** * * * *
• **Microbiology** • **Labrotory experiments in microbiology** • **Practecal microbiology**	**Main references (sources)-** - -
	Books and references that he recommends (scientific journals, reports……)- -

	-
	Electronic references, websites- - -

12- Curriculum development plan
Implicit addition of new information within the main course contexts Add new registered parasites

Second Stage/ computer applications co260

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Computer applications co260
4. Programs included in	Bachelor's, Master's, Doctorate

5. Attendance Form Available	Weekly
6. Semester/ Year	2022-2023
7. Total of study hours	30 hours + 30 practical hours
8. The course description was	prepared in 01/09/2022

9. Aims of the Course

In the co260 course, we will introduce the student to the MATLAB program that specializes in solving complex mathematical equations and calculus, in addition to some scientific applications in many fields. We will focus on introducing the student to some of the basic functions in mathematics, vectors, matrices, and many other important functions that deal with data in the form of matrices. Educating the student on some important functions in the process of representing data in the form of graphs.

12.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Introducing the student to MATLAB.

a.2. Dealing with mathematical variables and equations in Matlab .

a.3.Dealing with arrays, vectors, and mathematical operations provided by Matlab .

a.4.Programming for condition sentences, loop sentences and coder language MATLAB.

a.5. Matlab graphics.

b- **Subjective- Specific Skills**

b.1. A1- Solve equations in MATLAB language.

b.2. Knowing some of the applications and functions of the Matlab language.

Learning Methods

1. question and answer
2. Explanation of the lectures
3.discussion

Evaluating Methods

1- weekly test
2- Monthly exams
3-oral questions - Student participation
4- Final exams

C- Emotional and evolutional goals

c.1. Understand the importance of MATLAB language.
c.2. Mathematical operations with deal easily.
c.3. Understand the data through the Matlab graphics.

Learning Methods

1. Explanation and Discussion of the Lectures.
2. Send lecture videos for later use.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the mental abilities of the student
2. Developing the skills
3. Dealing with field and laboratory

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

3. Sequencing of course content

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed week	**2 h. lect. 2h. lab.**	Theoretical: Introduction in Matlab Library functions Vectors in Matlab Vectors in Matlab Practical: Studying the matlab language and applicate some library functions in matlab	**Knowledge and understanding of lectures**	**Understand the** MATLAB Identify some important functions	**Daily and monthly tests**
3ed,4 th weeks	**2 h. lect. 2h. lab.**	Theoretical: Vectors in Matlab Vectors in Matlab Practical: applicate some library functions and vectors in matlab program.	**Knowledge and understanding of lectures**	Identify vectors and methods of their creation Dealing with vectors and mathematical processes on them	**Daily and monthly tests**
5 th week	**2 h. lect. 2h. lab.**	Theoretical: first semester exam practical: practical first semester exam			
6 th ,7 th, and 8th weeks	**2 h. lect. 2h. lab.**	Theoretical: matrixes operations on matrixes Matrix and vector functions Practical: matrices operations on matrices Matrix and vector functions	**Knowledge and understanding of lectures**	Identify matrices and methods of their creation Dealing with matrices	**Daily and monthly tests**

				and mathematical processes on them Learn about some important functions for dealing with arrays and vectors.	
9 th, 10 th and 11th weeks	**2 h. lect. 2h. lab.**	Theoretical: Input and output sentences conditional if sentence conditional switch Practical: Input and output sentences conditional if sentence conditional switch	**Knowledge and understanding of lectures**	Learn about the input and output sentences and the compariso n operations provided by Matlab Understan ding the conditional sentence if and switch conditional sentence	**Daily and monthly tests**
12 th week	**2 h. lect. 2h. lab.**	Theoretical: second semester exam practical: practical second semester exam			
13 th week, and 14th weeks	**2 h. lect. 2h. lab.**	Theoretical: Loop functions for and while Practical: Loop functions for and while	**Knowledge and understanding of lectures**	**Learn about loop function for and while**	**Daily and monthly tests**
15 th week,	**2 h. lect. 2h. lab.**	Theoretical: Matlab graphic Practical:	**Knowledge and understanding of lectures**	Learn about	**Daily and monthly tests**

		Matlab graphic		some important functions for getting graphs in Matlab	

1- Textbooks required for the course	
2 References	1. MATLAB Help Version 6.5 2. MATLAB 6.5 الدليل المرجعي والتعليمي، المهندس عبد الكريم البيكو، (دار شعاع للنشر). 3. Matlab: A Practical Introduction to Programming and Problem Solving Butterworth-Heinemann is an imprint of Elsevier 2009
Recommended readings	Read and watch the lectures of the lecturer on his page on the university website
Electronic website	

12. Course Development Plan

Course development based on recent versions of books and references..
The adoption of modern interactive teaching methods.
Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

Third Stage/ Genetics of Microbiology B322

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Genetics of Microbiology
4. Attendance Form Available	Weekly
5. Semester/ Year	2021-2020
6. Total of study hours	30 hours + 60 practical hours
7. The course description was	prepared in 17/09/2020

8. Aims of the Course

Adding a new scientific knowledge, Modern methods of diagnosis and classification of microorganisms, and to recognition of DNA, its use, changes that occur in it, and methods to use it in diagnosis and classification

9. Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

1-DNA structure
2-DNA mutation
3-Genetics identification
4-Genetics classification

b- Subjective- Specific Skills

b.1.Recognize the sources of DNA mutation.
b.2. Acquiring the skills of DNA mutation reparis
b.3. Identification and understanding of Genetic methods and how to achieve them.

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

1- Daily test and reports
2- Monthly exams
2- Final exams

C- Emotional and evolutional goals

1. The ability to learn DNA structure of microbiology.
2. Linking knowledge to our life.

Learning Methods

1. Explanation and Discussion of the Lectures
2. Boosting the student to conduct research and reports.
3. The student PowerPoint presentations.

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

3. Dealing with field and laboratory

4. Monitoring and evaluating water resources in the environment and the impact of climate change

10. The structure of the course

Evaluation method	Learning method	Unit or course or topic	Learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: **DNA and RNA structure** Practical: DNA isolation	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**1**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: DNA replication practical: DNA spontaneous mutation and repair	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**2**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: DNA replication in Laboratory practical: DNA replication in Laboratory	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**3**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: DNA replication in Procaryote practical: DNA replicationfrom Procaryote	**oflectures**		

Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: DNA replication in Eucaryote	**Knowledge and**		
		practical: DNA replication from Eucaryote			
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: DNA-RNA expression Practical: DNA induced mutation	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Controlable gene or operon Practical: B-lactamase (ONPG)	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Classification of mutation practical: Genome mutation	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	Theoretical: Mutagens practical: UV-light	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**9**

	presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Repair of mutation practical: Repair of mutation	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical Plasmid practical: Plasmid isolation	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**11**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Cosmid practical: Mutation by antibiotics	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**12**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Bacteriocin practical: Bacteriocins effect	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	Theoretical: Identification of microorganisms by	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**14**

	presentations and scientific films Practical application	16S rRNA gene Practical: Genetics identification			
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	second semester exam	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**15**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Methods of classification and identification of microorganisms Practical : Genetics classification	**Knowledge and understanding oflectures**	2 h. lect. 3h. lab.	**16**

11. Infrastructure	
1- Textbooks required for the course	
2 References	1- Tortora G.J., Funke B.R. and Case K.L.. (1997). Microbiology. 6th ed. pp: 276-89. Bejamin Kumming, Publ. Co. California. 2- Prescott L. M., Harley J. P. and Klein D. A. (1999). Microbiology. 4thed. Pp:255-334. WCB McGraw-Hill. USA. 3- Jerome J.P. and James T.S. Microbiology: Dynamics and Diversity. (Book). 4- Abd Al-Abbas M.J., Al-Hadithi , H. T. and Al-Badran, A. I. (2012). MLSTof *S.aureus* Isolates Identified by *16S rRNA* Gene Sequencing. LapLambert Co. Germany.

Recommended readings	1- وفاء جاسم الرجب و حسن محمد علي القزاز. علم الاحياء المجهرية ،الجزء الاول، ترجمة ، جامعة الموصل (كتاب منهجي). 2- غالب حمزة البكري. مبادئ الهندسة الوراثية. جامعة البصرة(كتاب منهجي).

12. Course Development Plan

Course development based on recent versions of books and references..
The adoption of modern interactive teaching methods.
Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

B378 – Medical plants - third Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Medical plants B378**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2022-2023**
6. Total of study hours	**Two hours of theory +one practical hour**

7. The course description was	**1-9-2023**

8. Aims of the Course

Introduce the student to the meaning of Medical plants

Preparing a staff capable of diagnosing mycolog Medical plants y

Preparing a staff capable of conducting research on the Medical plants

Preparing a staff capable of carrying out general examinations

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

Recognize the types of active compounds in medicinal plants

b- Skill objectives for the course

Knowledge of medicinal plants and howto extract effective compounds from them

Teaching and learning methods

Theoretical and practical lectures

Use of educational aids, presentations and scientific films

Practical application

Evaluation methods

Theoretical, semester and final exams

C- Emotional and value goals **The ability to communicate information after collecting and promising data** **Linking information to human health**
D- Transferred general and rehabilitative skills (other skills related to employability and personal development) **Developing the mental abilities of the student**

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**A historical overviews of medical plants and distribution of medical plants**	Student understanding of the lesson	2 h. lect. 3h. lab.	**1**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**The importance of medicinal plants and production of medical plants**	Student understanding of the lesson	2 h. lect. 3h. lab.	**2**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Alkaloids –what are alkaloids and their importance with names and characteristic**	Student understanding of the lesson	2 h. lect. 3h. lab.	**3**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films	**Taxonomic of alkaloids**	Student understanding of the lesson	2 h. lect. 3h. lab.	**4**

	Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Glycosides – what are glycosides and their importance with names and characteristic**	Student understanding of the lesson	2 h. lect. 3h. lab.	**5**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Taxonomic of glycosides**	Student understanding of the lesson	2 h. lect. 3h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Volatil oils**	Student understanding of the lesson	2 h. lect. 3h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**TANINS**	Student understanding of the lesson	2 h. lect. 3h. lab.	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Exam 2**	Student understanding of the lesson	2 h. lect. 3h. lab.	**9**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Resins and pitter princibles**	Student understanding of the lesson	2 h. lect. 3h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and	**Examples of some plant families rich in medicinal substances**	Student understanding of the lesson	2 h. lect. 3h. lab.	**11**

	scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Basidiomycetes**	Student understanding of the lesson	2 h. lect. 3h. lab.	**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Diseases and medicinal plants**	Student understanding of the lesson	2 h. lect. 3h. lab.	**14**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**How to use medical plants**	Student understanding of the lesson	2 h. lect. 3h. lab.	**15**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application		Student understanding of the lesson	2 h. lect. 3h. lab.	**16**
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11- Infrastructure	
medical plants and herbal medicine • •	Required course books: * * * *
Encyclopedia of medicinal and aromatic plants	Main references (sources)- - -
	Books and references that he recommends (scientific journals, reports……)- - -
	Electronic references, websites- -

	-

12- Curriculum development plan

Implicit addition of new information within the main course contexts

Add new registered medical plants

B366 – Basic Immunology- third Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Immunology- B 366**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2022-2021**

6. Total of study hours	**Two hours of theory +Two practical hour**
7. The course description was	**2021-2022**

8. Aims of the Course

- **The course aims to define immunology**
- **Directed the students towards the role of immune system and immune cells in immune response .**

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

- **Define immunology, the immune system and immune cells and their role in immune response .**
- **Define the antigen and antibody and types of antibodies**
- **Define the roles of antibodies during the immune response**
- **Explaining the humoral and cellular immune response**

b- Skill objectives for the course

Acquisition of immunological view related with defense mechanisms against infections

Teaching and learning methods

Theoretical and practical lectures

Using of educational aids, presentations and scientific films

Practical application

Evaluation methods

Theoretical, semester and final exams

C- Emotional and value goals

The ability to communicate information after collecting and promising data

Linking information to human health

Preserve the wealth

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

Developing the mental abilities of the student

Knowing the health reality

Dealing with machines and kits specific for different immunological tests

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Historical background and types of immune response	Student understanding of the lesson	2 h. lect. 2h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and	**Components of innate immunity**	Student understanding of the lesson	2 h. lect. 2h. lab.	2

	scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Types of adaptive immunity**	Student understanding of the lesson	2 h. lect. 2h. lab.	**3**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Phagocytosis and inflammation**	Student understanding of the lesson	2 h. lect. 2h. lab.	**4**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Cells of immune system**	Student understanding of the lesson	2 h. lect. 2h. lab.	**5**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Tissues of immune system**	Student understanding of the lesson	2 h. lect. 2h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Antigen**	Student understanding of the lesson	2 h. lect. 2 h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Antibodies**	Student understanding of the lesson	2 h. lect. 2h. lab.	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	**Complements components**	Student understanding of the lesson	2 h. lect. 2h. lab.	**9**

	presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Major histocompatibility complex**	Student understanding of the lesson	2 h. lect. 2h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Humoral and cellular immune reponse**	Student understanding of the lesson	2 h. lect. 2h. lab.	**11**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Antigen and antibodiy reaction**	Student understanding of the lesson	2 h. lect. 2h. lab.	**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Hypersensitivity**	Student understanding of the lesson	2 h. lect. 2h. lab.	**14**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Autoimmunity**	Student understanding of the lesson	2 h. lect. 2h. lab.	**15**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Immune deficiency and transplantation**	Student understanding of the lesson	2 h. lect. 2h. lab.	**16**
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11- Infrastructure	
books:	**Required course books: ***
Immunology Kuby 2013	*
Basic Immunology 2015	*
Roitt's essential immunology 2006	*
Immunology and serology 2014	*
Cellular immunology 2015	**Main references (sources)-**
Basic Immunology 2016	-
	-

	Books and references that he recommends (scientific journals, reports……)- **-** **-**
	Electronic references, websites- **-** **-**

12- Curriculum development plan
Implicit addition of new information within the main course contexts

Third Stage/ Aquatic plants B356

Course Description Form

This course deals with aquatic plants, which gives information about the importance of aquatic plants and classification. As well as study the morphology, ecology and anatomy floating, emerged and submerged plants. The factors effect of distribution and spread and control of the aquatic plants also studied. The reproductive methods and growth of aquatic plant. In addition, studying the classification of aquatic plants and identifying the orders and families with gives description.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it.	Aquatic plants B356
4. Attendance Form Available	Weekly
5. Semester/ Year	2023-2022
6. Total of study hours	2 hours + 2 practical hours
7. The course description was	1-9-2023

8. Aims of the Course

know and define aquatic plants, -Classification and floating, emerged, and submerged plants, as well as Study the reproductive methods, also -study description Aquatic plants and study the anatomy and morphology of plants.

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

6- Is to know and define aquatic plants
2 -Classification and floating, emerged, and submerged plants
3- -Study the reproductive methods
4 -Study description Aquatic plants
5-Study the anatomy and morphology of plants

b- Skill objectives for the course

1. To do different laboratory analysis in animal and plant structure.
2. Measurement of some physical and chemical factors.
3. To diagnosis all types of aquatic plants.

Teaching and learning methods.

1. Explanation and Discussion of the Lectures
2. boosting the student to make reports, and power point presentation.

Evaluation methods

1- Daily test and reports

2- Monthly exams and final exams.

C- Emotional and value goals

Training the student to use different apparatus in the laboratory and develop research capacities to the students.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

1. Developing the skills mental abilities of the student
2. Dealing with laboratory work.

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Introduction and important of aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Distribution, diffusion, geography, and environment of aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Control of aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	The factors effect of aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Ecological groups of aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	Morphology and nature of aquatic plants	Student understandin	2 h. lect. 3h. lab.	6

	presentations and scientific films Practical		g of the lesson		
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Anatomy and internal structure of aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	7
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Biological indicators, energy and transport in aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Sea grasses, salt marshes and mangroves classification and division	Student understanding of the lesson	2 h. lect. 3h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Growth and breeding of aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Propagation of aquatic plants and modification of stems in aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab.	11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Bryophytes and pteridophytes morphology and description as well as Gymnosperms and angiosperms	Student understanding of the lesson	2 h. lect. 3h. lab.	12
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Dicotyledons species of aquatic plants, morphology, and description	Student understanding of the lesson	2 h. lect. 3h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Monocotyledons species of aquatic plants morphology and description	Student understanding of the lesson	2 h. lect. 3h. lab.	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	Role of aquatic plants in environmental balance	Student understanding of the lesson	2 h. lect. 3h. lab.	15

11- Infrastructure	
	Required course books: * * * * *

1- **Aquatic Plant Book - Christopher D. K. Cook** **2- A.M.Al-Obaidi (2012)** **3- lectures power points-**	**Main references (sources):**
	Books and references that he recommends (scientific journals, reports……) **-** **-** **-**
http://wilkibooks. **www.Jairr.com** **www.damastagate.com**	**Electronic references, websites**

12. Course Development Plan

Depending on modern references and books.
Scientific trips in field.
Using and training of different lab apparatus.

Third Stage/ Aquatic ecology B373

Course Description Form

Aquatic Ecology is a general introduction to aquatic ecosystems structure and function of freshwater water, lakes, and brackish water. The course covers properties of water, and biodiversity of organisms. As well as Physical, chemical and hydrological processes in aquatic ecology and its importance to the organisms and ecosystem function. In addition, study of primary production, food webs in various habitats, role of bacteria in ecology and the importance of ecosystem productivity.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	**Aquatic ecology B373**
4. Attendance Form Available	Weekly
5. Semester/ Year	2022-2023
6. Total of study hours	2 hours + 2 practical hours
7. The course description was	1-9-2023

8. Aims of the Course

Study physical, chemical, and hydrological processes in aquatic, the classification of ecosystem also study, the primary production, food webs and the function of freshwater water, lakes, and brackish water also studied

9. Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals.

7- Physical, chemical, and hydrological processes in aquatic ecology and its importance to the organisms and ecosystem function Its parts and kinds of biology.

8- Study the classification of ecosystem

9- Study primary production, food webs

Study the function of freshwater water, lakes, and brackish water

b- Skill objectives for the course

1.To do different laboratory analysis in animal and plant structure.

2. Measurement of some physical and chemical factors.

3. To the importance of water for all organisms.

Teaching and learning methods.

1. Explanation and Discussion of the Lectures

2. boosting the student to make reports, and power point presentation.

Evaluation methods

1- Daily test and reports

2- Monthly exams and final exams.

C- Emotional and value goals

Training the student to use different apparatus in the laboratory and develop research capacities to the students.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

1. Developing the skills mental abilities of the student
2. Dealing with laboratory work.

10- Course structure					
Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Important of aquatic ecology and role of algae and fish in aquatic ecology	Student understanding of the lesson	2 h. lect. 3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Ecosystem and the physical and chemical of water	Student understanding of the lesson	2 h. lect. 3h. lab	2
Daily and monthly tests	Theoretical and practical lectures Use of	Types of Aquatic ecosystem	Student understanding of the lesson	2 h. lect. 3h. lab	3

	educational aids, presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Study primary production, food webs, and covers properties of water, and .biodiversity of organisms	Student understanding of the lesson	2 h. lect. 3h. lab	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Net and gross production, Thermal stratification, and ecological efficiency	Student understanding of the lesson	2 h. lect. 3h. lab	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Lack's structure, shape, and methods of formation	Student understanding of the lesson	2 h. lect. 3h. lab	6
Daily and monthly tests	Theoretical and practical lectures Use of educational	organism in aquatic ecology	Student understanding of the lesson	2 h. lect. 3h. lab	7

	aids, presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Rivers, types and how can changes with environment	Student understanding of the lesson	2 h. lect. 3h. lab	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Oceans, Estuarian, fresh water	Student understanding of the lesson	2 h. lect. 3h. lab	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Chemical composition and it's associated in photosynthesis	Student understanding of the lesson	2 h. lect. 3h. lab	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	Classification of zones of aquatic ecology	Student understanding of the lesson	2 h. lect. 3h. lab	11

	presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Factors effect on coral reef	Student understanding of the lesson	2 h. lect. 3h. lab	12
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Biotic and Abiotic effect on aquatic ecology	Student understanding of the lesson	2 h. lect. 3h. lab	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Role of microorganism in aquatic plants	Student understanding of the lesson	2 h. lect. 3h. lab	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentation	Communities in Aquatic ecology and Adaptations of organisms in aquatic ecology	Student understanding of the lesson	2 h. lect. 3h. lab	15

	s and scientific films Practical application				

11- Infrastructure	
Aquatic plants	**Required course books:** * * * * *
1-Fundamentals of Aquatic Ecology, 2nd Edition, **R. S. K. Barnes , K. H. Mann** **2-R, Mishra S., and Saksena D. N. 1949-, eds. *Aquatic ecology*. Delhi:** **3-lectures power points-**	**Main references (sources):**
	Books and references that he recommends (scientific journals, reports……) - - -
http://wilkibooks. **www.Jairr.com** **www.damastagate.com**	**Electronic references, websites**

12. Course Development Plan

Depending on modern references and books.
Scientific trips in the field.
Using and training of different lab apparatus.

Animal physiology B321- Third Stage/

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	**Animal physiology B321**
4. Attendance Form Available	Weekly
5. Semester/ Year	2022-2021
6. Total of study hours	30 hours + 60 practical hours
7. The course description was	1-9-2023

8. Aims of the Course

Develop the student's ability to identify different human systems. To identify the functions of different organs system .Also to demonstrate the relationship between different diseases related with different system.

9. Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. To identify different human system.
a.2.To demonstrate blood percentage and blood pressure .
a.3. To know how to count precise number of white and red bllod cells in .human .

b- Subjective- Specific Skills
b.1.To do different laboratory analysis in human an blood .

b.2. Measurement of cholesterol .
b.3. To diagnosis all types of anemia .

Learning Methods

1. Explanation and Discussion of the Lectures
2. boosting the student to make reports, and power point presentation .

Evaluating Methods

1- Daily test and reports
2- Monthly exams and final exam .

C- Emotional and evolutional goals

Training the student to use different apparatus in the laboratory and develop research capacities to the students.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the skills mental abilities of the student
2. Dealing with laboratory work.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

Developing the mental abilities of the student
Knowing the health reality

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Cell physiology ,endocrine system. Practical: Sable method , white blood cell count.	Student understanding of the lesson	2 h. lect. 3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Digestive system ,disorder of didestive system practical:	Student understanding of the lesson	2 h. lect. 3h. lab.	2

		differential white blood cell count and platelet count			
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Nervous system , circulatory system Practical: RBC count , ESR	Student understanding of the lesson	2 h. lect. 3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Nervous system , circulatory system Practical: RBC count , ESR	Student understanding of the lesson	2 h. lect. 3h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Urinary system and disorder . Practical: Pcv count ,Bleeding and coagulation time .	Student understanding of the lesson	2 h. lect. 3h. lab.	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Urinary system and disorder . Practical: Pcv count ,Bleeding and coagulation time .	Student understanding of the lesson	2 h. lect. 3h. lab.	6
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Respiratory system and related disease Practical: ABO blood group ,measure blood pressure .	Student understanding of the lesson	2 h. lect. 3h. lab.	7
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: semester exam Practical: Measure blood sugar	Student understanding of the lesson	2 h. lect. 3h. lab.	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Reproductive system and related disease . Practical : Practical semester exam	Student understanding of the lesson	2 h. lect. 3h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Reproductive system and related disease	Student understanding of the lesson	2 h. lect. 3h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Skeletal system and related disease .	Student understanding of the lesson	2 h. lect. 3h. lab.	11

Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Muscle system and related disease .	Student understanding of the lesson	2 h. lect. 3h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Reproductive system and related disease .	Student understanding of the lesson	2 h. lect. 3h. lab.	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application		Student understanding of the lesson	2 h. lect. 3h. lab.	15
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application		Student understanding of the lesson	2 h. lect. 3h. lab.	16
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12. Course Development Plan
Depending on modern references and books . Scientific trips to laboratories and hospitals . Using and training of different lab apparatus .

11. Infrastructure	
1- Textbooks required for the course	-physiology -hematology - Endocrinology
2 References	Functional anatomy and physiology of domestic animal .
Recommended readings	Cyton Book of physiology
Electronic website	http://wilkibooks. www.Jairr.com www.damastagate.com

Third Stage/ Genetics B301

Course Description Form

Genetics can be defined as the study of genes at all levels, including how the human cell and other organisms work and how traits and genetic factors are transmitted from parents to offspring. Genetics is the principle of biology and interferes with many other fields, such as medicine, agriculture, and biotechnology.

1.Educational Institution	College of Science/ University of Basrah

2. Department	Biology
3. Course name/Code 1. Programs included in it	Genetics B 301
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2022-2023
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/09/2023

9. Aims of the Course

To make students more aware of genetics importance in our life by understanding that genetic mutations can cause different diseases in humans and affect the agricultural fields. Develop student acknowledgments in cytology focusing on the nucleus, its genetic component, and its function. Knowledge of Mendelian laws and their applications.

13.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. The student can compare the different types of genetic traits.
a.2. To know the different structures of genetic material
a.3. The student can know how to deal with the practical aspects of genetic material

b- Subjective- Specific Skills

b.1. Compare the different types of genetic traits
b.2. Discuss how genetic traits appear on living organisms

Learning Methods

1. Explanation and Discussion of the Lectures 2. It is boosting the student to conduct research and reports. 3. Urging the student to make PowerPoint presentations.
Evaluating Methods
1- Daily test and reports 2- Monthly exams 2- Final exams
C- Emotional and evolutional goals 1. The student must be willing to communicate with others to achieve a specific goal. 2. The student should be able to collect and summarize useful information related to a study.
Learning Methods
1. Explanation and Discussion of the Lectures 2. Boosting the student to conduct research and reports. 3. The student PowerPoint presentations.
d- General qualification skills transferred (other skills related to employability and personality development) 1. Developing the mental abilities of the student 2. Developing the skills 3. Dealing with field and laboratory

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

4. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Chromosome structre Genetic material discovery experiments DNA structure	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	DNA replication RNA transcription Protein synthesis	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	Mendelian laws First law Second law	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	Types of dominance	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week,		First-semester exam			
12th weeks and 13th	**2 h. lect. 2h. lab.**	Gene interaction	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Crossing over and mutation	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the**	**Daily and monthly tests**

				laboratory	
16th week	**2 h. lect. 2h. lab**	Second semester	**Knowledge and of lectures**	**Understand the evolving state learn to carry field and in the**	**Daily and monthly tests**

11. Infrastructure	
1- Textbooks required for the course	
2 References	Human Genetics Ricki Lewis
Recommended readings	Genetics From genes to genome Ann Reynolds
Electronic website	

12. Course Development Plan
Course development is based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange experiences.

B306 – parasitology- third Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Parasitology- 306**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2022-2023**
6. Total of study hours	**Two hours of theory +one practical hour**
7. The course description was	**1-9-2023**

8. Aims of the Course

Introduce the student to the meaning of parasitology

Preparing a staff capable of diagnosing parasites

Preparing a staff capable of conducting research on the types of parasites

Preparing a staff capable of carrying out general medical examinations

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

Recognize the types of parasites

Medical importance and risks

controlling it

b- Skill objectives for the course

Acquisition of parasitological diagnosis skills

Control of its transmission routes

prevention

Teaching and learning methods

Theoretical and practical lectures

Use of educational aids, presentations and scientific films

Practical application

Evaluation methods

Theoretical, semester and final exams

C- Emotional and value goals

The ability to communicate information after collecting and promising data

Linking information to human health and psychological reality

Preserve the wealth

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

Developing the mental abilities of the student

Knowing the health reality

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films	Defining parasitism and relationships	Student understanding of the lesson	2 h. lect. 3h. lab.	1

	Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Sarcodina	Student understanding of the lesson	2 h. lect. 3h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Intestinal flagellates	Student understanding of the lesson	2 h. lect. 3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Blood flagellate	Student understanding of the lesson	2 h. lect. 3h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Trichomonas spp.	Student understanding of the lesson	2 h. lect. 3h. lab.	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Tissue flagellates	Student understanding of the lesson	2 h. lect. 3h. lab.	6
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Liver worms	Student understanding of the lesson	2 h. lect. 3h. lab.	7
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and	Intestinal trematode	Student understanding of the lesson	2 h. lect. 3h. lab.	8

	scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Pumonary tematoda	Student understanding of the lesson	2 h. lect. 3h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Cestoda	Student understanding of the lesson	2 h. lect. 3h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Echinococcus	Student understanding of the lesson	2 h. lect. 3h. lab.	11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Taenia saginata	Student understanding of the lesson	2 h. lect. 3h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Fish tape worm	Student understanding of the lesson	2 h. lect. 3h. lab.	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Schistosoma spp	Student understanding of the lesson	2 h. lect. 3h. lab.	15
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	Nematoda species	Student understanding of the lesson	2 h. lect. 3h. lab.	16

	presentations and scientific films Practical application				
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11- Infrastructure	
books: • **Foundation of parasitology animal vector** • **Human parasitology**	**Required course books: *** * * * *
• **Diagnostic medical parasitology**	**Main references (sources)-**

• **Essentials of medical parasitology** • **Basic laboratory methods in clinical parasitology**	**-** **-**
	Books and references that he recommends (scientific journals, reports……)- **-** **-**
	Electronic references, websites- **-** **-**

12- Curriculum development plan
Implicit addition of new information within the main course contexts **Add new registered parasites**

B311 – mycology- third Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**

2. Department	**Biology**
3- Name/code of the course	**Mycology -B311**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2022-2023**
6. Total of study hours	**Two hours of theory +one practical hour**
7. The course description was	**1-9-2023**

8. Aims of the Course

Introduce the student to the meaning of mycology

Preparing a staff capable of diagnosing mycology

Preparing a staff capable of conducting research on the types of mycology

Preparing a staff capable of carrying out general examinations

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

Recognize the types of fungi and taxonomy
b- Skill objectives for the course **Acquisition of mycological diagnosis skills** **Control of its transmission routes** **prevention**
Teaching and learning methods **Theoretical and practical lectures** **Use of educational aids, presentations and scientific films** **Practical application**
Evaluation methods **Theoretical, semester and final exams**
C- Emotional and value goals **The ability to communicate information after collecting and promising data** **Linking information to human health and psychological reality** **Preserve the wealth**
D- Transferred general and rehabilitative skills (other skills related to employability and personal development) **Developing the mental abilities of the student** **Knowing the health reality**

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	**Mycology definition**	Student understanding of the lesson	2 h. lect. 3h. lab.	1

	presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Mycology classificatio**	Student understanding of the lesson	2 h. lect. 3h. lab.	**2**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**myxomycota**	Student understanding of the lesson	2 h. lect. 3h. lab.	**3**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**plasmodiophoromycetes**	Student understanding of the lesson	2 h. lect. 3h. lab.	**4**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Chromista kingdom**	Student understanding of the lesson	2 h. lect. 3h. lab.	**5**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**chytridiomycetes**	Student understanding of the lesson	2 h. lect. 3h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**zygomycetes**	Student understanding of the lesson	2 h. lect. 3h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures	**Ascomycetes**	Student understanding of the lesson	2 h. lect. 3h. lab.	**8**

	Use of educational aids, presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Taphrinomycotina**	Student understanding of the lesson	2 h. lect. 3h. lab.	**9**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Saccharomycotina**	Student understanding of the lesson	2 h. lect. 3h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Pezizomycotina**	Student understanding of the lesson	2 h. lect. 3h. lab.	**11**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Basidiomycetes**	Student understanding of the lesson	2 h. lect. 3h. lab.	**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**exam**	Student understanding of the lesson	2 h. lect. 3h. lab.	**14**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Ascomycetes**	Student understanding of the lesson	2 h. lect. 3h. lab.	**15**
Daily and	Theoretical and	**Mycology definition**	Student understanding of the	2 h. lect.	**16**

monthly tests	practical lectures Use of educational aids, presentations and scientific films Practical application		lesson	3h. lab.	
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11- Infrastructure	
Introduction to fungi • •	Required course books: * * * * *

• Diagnostic medical mycology Clinical mycology	Main references (sources)- - -
	Books and references that he recommends (scientific journals, reports……)- - -
	Electronic references, websites- - -

12- Curriculum development plan
Implicit addition of new information within the main course contexts Add new registered fungi

Third Stage/ Embryology B310

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating

whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Embryology B310
4. Programs included in	Bachelor's
5. Attendance Form Available	Weekly
6. Semester/ Year	2022_2023
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/09/2023

9. Aims of the Course

Develop the student's ability to recognize the importance of development of Embryology , identifying the composition of organs and recognize and eliminate foetal abonrmalities in the future

14.Course outcomes and methods of teaching, learning and assessment

Knowledge and Understanding goals

1. Acquisition of histology screening skill of natural fetuses.

2. How to transplant animal compensatory tissue to lost fetal organs at all stages of pregnancy.

3. How to perform artificial insemination in the infertility center to preserve the organisms offspring.

4. Tying this science to the applied medical science necessary to keep an organism,including man,from extinction.

5.with advanced genetics,it is possible to rid the embryology stage of deadly genetic disease like hereditary hemorrhage and so on.

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

1- Daily test and reports
2- Monthly exams
2- Final exams

C- Emotional and evolutional goals

1. The ability to recognize the importance of the basics of development of Embryology.
2. Linking knowledge to environmental reality.

Learning Methods

1. Explanation and Discussion of the Lectures
2. Boosting the student to conduct research and reports.
3. The student PowerPoint presentations.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the mental abilities of the student
2. Developing the skills
3. Dealing with field and laboratory
4. Monitoring basic of development of Embryology ,identifying the composition of organs and recognize and eliminate foetal abnormalities in the future.

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

5. Sequencing of course content

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week	**2 h. lect. 2h. lab.**	Theoretical: Gamatogenesis in vertebrates Practical: Gamatogenesis in vertebrates	**Knowledge and understanding oflectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
2 th week,	**2 h. lect. 2h. lab.**	Theoretical: Fertilization Practical: Development in Amphioxus: 1-Egg&Fertilization 2-Cleavage&Morula stage 3-Blastula	**Knowledge and understanding oflectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
3th week,	**2 h. lect. 2h. lab.**	Theoretical: Cleavage in Amphioxus,Frog and Chicken Practical: Gastrula &Germ layer formation in Amphioxus	**Knowledge and understanding oflectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4th week,	**2 h. lect. 2h. lab.**	Theoretical: Blastula in Amphioxus,Frog and Chicken Practical: Neural tube&Organogenesis in Amphioxus	**Knowledge and understanding oflectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
5th week,	**2 h. lect. 2h. lab.**	Theoretical: Gastrulation in Amphioxus&Frog Practical: Early& Late in Embryo&Larva in Amphioxus	**Knowledge and understanding oflectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

6th week,	**2 h. lect. 2h. lab.**	Theoretical: Gastrulation inBird Partical: EXAM 1	**Knowledge and understanding oflectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7th week	**2 h. lect. 2h. lab.**	Theoretical: Neuralation&Germ layer formation of Amphioxus,Frog& Chicken Practical: Development in Frog	**Knowledge and oflectures understanding**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
8th week	**2 h. lect. 2h. lab.**	Theoretical: EXAM 1 Practical: Neuralation formation in Frog	**Knowledge and oflectures understanding**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9th week	**2 h. lect. 2h. lab.**	Theoretical: Organogenesis:section1: Eye development Practical: Neual tube &Organogenesis in Frog	**Knowledge and oflectures understanding**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
10th week	**2 h. lect. 2h. lab.**	Theoretical: Organogenesis:section2: development of nervous system Practical: Larva3-5mm in frog	**Knowledge and oflectures understanding**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11th week	**2 h. lect. 2h. lab.**	Theoretical: Organogenesis:section3: Heart development Practical: Larva5-7mm in frog	**Knowledge and oflectures understanding**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
12th week	**2 h. lect. 2h. lab.**	Theoretical: Organogenesis:section4: Limb development Practical: Section in 24,33 and72 hr. in chick embryo	**Knowledge and oflectures understanding**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
13th week	**2 h. lect. 2h. lab.**	Theoretical: EXAM 2 Practical: EXAM2	**Knowledge and oflectures understanding**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

third Stage/ Pollution B376

Course Description Form

This course aims to provide students with basic information about pollution in general and environmental pollution in particular, and to identify the types of pollution present in our environment and the degrees of pollution.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Pollution B376
4. Programs included in	Bachelor's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2022-2023
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/09/2022

9. Aims of the Course
Identify the types of environmental pollutants, their causes, sources and methods of treatment

15.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Identify the components of the environment and the most important pollutants that it suffers from .

a.2. The pollution practical course aims to teach the student the methods of preparing chemical solutions and standard solutions that are used to measure the various pollutants of the environment

a.3. Develop solutions and treatments for types of pollution in the aquatic environment, air and soil

b- **Subjective- Specific Skills**

b.1.study the effect of most pollutants in different areas.

b.2. determine the source of pollutants.

b.3. Develop solutions and treatments for types of pollution in the aquatic environment, air and soil

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

1- Daily test and reports
2- Monthly exams
2- Final exams

C- Emotional and evolutional goals

1. The ability to recognize the toxic material in our environment.
2. Linking knowledge to how we can decrease the effect of different pollutants.

d- **General qualification skills transferred (**other skills related to employability and personality development)

1. Developing the mental abilities of the student
2. Developing the skills
3. Dealing with field and laboratory
4. Linking knowledge to how we can decrease the effect of different pollutants .

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

6. Sequencing of course content

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Theoretical: **General introduction, types of environmental pollution and classification of pollutants . Air pollution, types, sources, harms. Pollution of cities, causes of urban pollution, source, prevention methods.** Practical: examine the pollution and pollution-related experiments, then solve the equation to determine the concentration of contaminants.	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	Theoretical: **Water pollution, its sources, types, and its effects on living organisms.** **Soil pollution, its sources, types and effects.** **Audio and visual pollution**. practical: examine the pollution and pollution-related experiments, then solve the equation to determine the concentration of contaminants.	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	**Solid waste, types, disposal and treatment methods. Radioactive pollution, types, damages, methods of prevention of radioactive contamination**.	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	**Renewable energy, its characteristics, diversity, importance**	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the**	**Daily and monthly tests**

				field and in the laboratory	
11 th week, and 12th weeks	**2 h. lect. 2h. lab.**	Theoretical: Modern ways to get rid of environmental pollution . The effect of environmental toxins on human physiology Practical: examine the pollution and pollution-related experiments, then solve the equation to determine the concentration of contaminants.	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
13 th week,	**2 h. lect. 2h. lab.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Theoretical: The effect of pollutants on the cellular and molecular level of humans . Practical : Practical semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure

1- Textbooks required for the course	
2 References	Environmental and Pollution Science Third Edition • 2019, Mark L. Brusseau, Ian L. Pepper and Charles P. Gerba .
Recommended readings	Pollution and environment books.
Electronic website	
12- Curriculum development plan Implicit addition of new information within the	

main course contexts The adoption of modern interactive teaching methods	

Course description form for the academic year 2021-2022

Course description : B379

The Molecular Biology course aims to deliver modern information to the student in this vital and important science for a graduate of Biology and focuses heavily on the study of the three large biological molecules, which are DNA, RNA and proteins, and their importance in the survival and health of the organism.

1- Educational institution	**University of Basrah**
2- Department / Center	**Department of Biology**
3- Course name / code	**B 379 - Molecular Biology**
4- Available forms of attendance	**Weakly**
5- Season / year	**2021 - 2022**
6- Number of hours of study (total)	**30 Hour**
7- The date of description	
8- Course objectives: **- Understand the principles of molecular biology.** **- Study of biological molecules DNA, RNA and proteins.**	
9- Program outcomes and methods of teaching, learning and assessment	
A- Cognitive goals: **- Nucleic acid composition and packaging.** **- Gene concept, DNA Replication.** **- Gene transcription and translation.** **- Regulation of gene expression.** **- DNA mutation and repair.**	
B- Course Skill objectives **- DNA extraction in different ways.** **- Using Molecular Biology Techniques in the Laboratory**	

Teaching and learning methods:

- Live explanation and use of Power Point slides.
- Use pictures and templates.
- Laboratory equipment.

Evaluation methods:

- Daily exams (Quiz)
- Reports
- Monthly exams

Emotional and value goals:

- The ability to communicate information.
- Learn about recent developments in the field of molecular biology
- The ability to explain things using molecular biology
- The ability to explain the origin of diseases and ways to treat them by studying genes and their products

Transferred general and qualification skills (other skills related to employability and personal development):

- Developing the student's mental abilities.
- Developing the student's skill abilities.
- How to handle laboratory equipment and sample preparation.

10- Course structure

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Weak
Questions, discussion and reports	Classroom or electronic lectures	Synthesis of nucleic acids			1
		DNA packaging			2
		Gene concept			3
		DNA Replication			4

		Replication problems and solutions			**5**
		Monthly Exam			**6**
		Gene transcription in prokaryotic			**7**
		Gene transcription in eukaryotic			**8**
		Types of RNA			**9**
		Gene translation			**10**
		The role of ribosomes in protein synthesis			**11**
		Monthly Exam			**12**
		Regulation of gene expression			**13**
		DNA mutation and repair			**14**
		Types of mutagens			**15**
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11- Infrastructure	
Books: **Principles of Molecular Genetics**	**Required course books:** * * * * *

	Main references (sources): Principles of Molecular Genetics
	Books and references that he recommends (scientific journals, reports……) **-** **-** **-**
	Electronic references, websites

12- Curriculum development plan **Relying on modern sources**

B316 – Algology - third Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	biology
3. **Name/code of the course**	Algology B-316

4. Attendance Form Available	Weekly
5. Semester/ Year	2020-2021
6. Total of study hours	Two hours of theory +one practical hour
7. The course description was	1-9-2021

8. Aims of the Course

Course Objectives: The practical algae course aims to:

- Introduce the student to the meaning of Algology
-Preparing a staff capable of diagnosing algology
- A statement of the open fields for the student studying this course or researcher in the field of algae science and the prospects available to him in the field of algae uses as a science that contributes to human renaissance.
- Encouraging the student of the course on how to benefit from algae in several fields, including the areas of purifying polluted water or using it as food for animals and fish, and it can be employed in the fields of health, agriculture, and industry

9-Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Recognize the types of algae in the world .
a.2. Recognize of the reproduction and life cycle in the grope of algae.
a.3. To develop the ability of the students to use some of the available devices such as microscopy
a.4. Taking students to some sites to learn about the environment of algae and compare it with other environments
a.5 Assigning students to bring water or mud samples to the laboratory and diagnose the algal species there.
a.6. Statement of the importance of algae, including water purification
.

b- **Skill objectives for the course**

b.1.Recognize of the grope of algae in different environment.

b.2 Acquire the skill of handling algae samples and make temporary slides to examine algae microscopically

b.3. Develop the student's ability to deal with algal specimens

Teaching and learning methods

1. Explanation and Discussion of the Lectures
2. Make short tests during the lesson.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

-Theoretical, semester

- Monthly exams
- Final exams

C- **Emotional and value goals**

1. The ability to recognize the importance of algae in different environment.
2. Linking knowledge to environmental reality.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

Developing the mental abilities of the student

Knowing the health reality

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Algology definition**	Student understanding of the lesson	2 h. lect. 3h. lab	**1**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Algology classificatio**	Student understanding of the lesson	2 h. lect. 3h. lab	**2**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Cyanophyceae**	Student understanding of the lesson	2 h. lect. 3h. lab	**3**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Chlorophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**4**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical	**Exam**	Student understanding of the lesson	2 h. lect. 3h. lab	**5**

	application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Chlorophyceae**	Student understanding of the lesson	2 h. lect. 3h. lab	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Xanthophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Chrysophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Bacillariophyceae**	Student understanding of the lesson	2 h. lect. 3h. lab	**9**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Pyrrophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**10**
Daily and	Theoretical and	**Cryptophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**11**

monthly tests	practical lectures Use of educational aids, presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Exam**	Student understanding of the lesson	2 h. lect. 3h. lab	**12**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Euglenophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Phaeophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**14**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Rhodophyta**	Student understanding of the lesson	2 h. lect. 3h. lab	**15**

11- Infrastructure	
Introduction to algology	**Required course books***
Phycology by Lee(2008, 2018)	**Main references (sources)-** **- Electronic references, websites** **-**

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences. Add new registered algae.

Fourth Stage/ comparative anatomy B424

Course Description Form

An academic course taught to fourth-stage students, the general biology branch, which includes a practical and a theoretical part. the course description provides a brief summary of animals Kingdome especially vertebrate, and study comparative characteries of their systems and organs, to give student advance skill to distinguish among animals anatomically.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	comparative anatomy B424
4. Programs included in	Bachelor's,
5. Attendance Form Available	Weekly
6. Semester/ Year	2020-2021
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/09/2021
9. Aims of the Course	
GIVE STUDENT ADVANCE SKILL TO DISTINGUISH AMONG ANIMALS ANATOMICALLY ,and help them to understand the relationship between different animals in morphology, anatomy, behavior, and development.	

16.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1-This course aims to provide students with basic information about a group of vertebrates and a comparative anatomical study of the different systems of these groups, such as the skeletal system, digestive system, respiratory system, reproductive system, excretory system, body cavity, skin, nervous system and sense organs.

a. 2-In order for the student to become familiar with the basic differences between animal groups in terms of similarity and anatomical differences between them and link them to the science of embryonic

b- Subjective- Specific Skills

b.1. . give student advance skill to distinguish among animals anatomically.

b.2. the student to become familiar with the basic differences between animal groups in terms of similarity and anatomical differences between them and link them to the science of embryonic

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

1- Daily test and reports
2- Monthly exams
2- Final exams

C- Emotional and evolutional goals

1. the student to become familiar with the basic differences between animal groups in terms of similarity and anatomical differences between them and link them to the science of embryonic
2. Linking knowledge to reality.

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

Developing the mental abilities of the student

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

7. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Theoretical: Introduction / definition of comparative anatomy / important references / main characteristics of vertebrates . Classification of vertebrates / examples of some animals / amphioxus / lampreys / jawed fishes. Classification of chondrichthyes fish with examples / Classification of osteichthyes fish with examples Practical: Students view different animal models in a slide or block form	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	Theoretical: Tetrapods / Classification of amphibians with examples / Classification of reptiles with examples. Classification of birds with examples/ Bird migration/ Classification of mammals with examples/ Theories of the transition of life from water to land. practical: Students view different animal models in a slide or block form.	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	Theoretical: Comparative anatomy of the skin of different vertebral groups with drawings / supplement . Comparative anatomy of the skeletal system in different vertebral groups Axial skeleton / skull / spine / vertebrae / sternum / ribs. Practical: Students view different animal models in a slide or block form	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	Comparative anatomy of the skeletal system / peripheral skeleton / shoulder girdle / pelvic girdle / upper and lower extremities	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry**	**Daily and monthly tests**

				out practical work, in the field and in the laboratory	
11 th week, and 12th weeks	**2 h. lect. 2h. lab.**	Theoretical: Comparative anatomy of the digestive system in the vertebral groups/stomach/intestines . Practical: Students view different animal models in a slide or block form	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
13 th week,	**2 h. lect. 2h. lab.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Theoretical: Comparative anatomy of the muscular system, nerve system . Practical : Practical semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure	
1- **Textbooks required for the course**	
2 References	Tex-book of comparative anatomy,part1,Dr.Aruold lang,2020,584p,alpha edition. [1]

Recommended readings	Comparative anatomy of vertebrates,edition 1,2008,by R.K.saxena,sumitra,saxena,479 p,Anshan.
Electronic website	

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

Fourth Stage/ Microbial physiology B452

Course Description Form

The course works on identify of diagnosis and classification of microorganisms according to energy sources and deals with the study of growth ,metabolism ,nutrition of organisms and enzymatic processes carried out by microorganisms

1.Educational Institution	College of Science / University of Basrah
17.Course outcomes and methods of teaching, learning and assessment	
2. Department	Biology
Knowledge and Understanding goals 3. A • Study of microbial growth 4. I• Know the types of microbial medium • Know the biosynthesis 5. A• Study of photosynthesis • Study of fermentation and anaerobic respiration	
6. Semester / Year	2021-2020
Learning Methods	
1. Explanation and Discussion of the Lectures 2. It is boosting the student to conduct research and reports. 3. Urging the student to make PowerPoint presentations.	
Evaluating Methods	
1- Daily test and reports 2- Monthly exams De 2- Final exams	
Emotional and evolutional goals Develop the student's ability to recognize the importance of Study of metabolism, nutrition, phototrophic, fermentation, aerobic respiration and anaerobic processes that organisms carry out in order to obtain energy Microbial biosynthesis , know the types of medium, know the growth of microbe and study of batch and continuous culture	

8. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Introduction to microbial physiology Culture media	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 6h. lab.**	Nutrition of microorganism Growth of microorganism	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 6h. lab.**	Phytosynthesis	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 6h. lab.**	Biosynthesis	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week, and 12th weeks	**2 h. lect. 6h. lab.**	Fermentation	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
13 th week,	**2 h. lect. 6h. lab.**	Aerobic and anaerobic respiration	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

14 th week, and 15th weeks	**2 h. lect. 6h. lab.**	Study of some types of Bacterial enzyme	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry work in the laboratory**	**Daily and monthly tests**

11. Infrastructure	
1- Textbooks required for the course	
2 References	**كتاب :** مبادئ فسلجة الاحياء المجهرية للدكتورة مها رؤوف السعد

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

Enzymes B 487 forth Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	**Enzymology B487**
4. Attendance Form Available	Weekly
5. Semester/ Year	2020-2021
6. Total of study hours	30 hours + 60 practical hours
7. The course description was	1-9-2020

8. Aims of the Course

Focuses on the theories of enzyme kinetics, the mechanisms of enzyme catalysis, and the mechanisms of enzyme regulation in the cell.

9. Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

1. Clarify the functions and effectiveness of enzymes in the human body and living organisms, the changes resulting from them, and the associated pathological conditions.
2. Providing students with the necessary knowledge of practical applications of enzymes in the laboratory.
3. Providing students with the necessary knowledge of practical applications of enzymology clinically.

b- Subjective- Specific Skills

b.1.To do different laboratory analysis in enzymes .

b.2. Measurement of liver enzymes .

b.3. To identify different enzymes actions .

Learning Methods

1. Explanation and Discussion of the Lectures
2. boosting the student to make reports, and power point presentation .

Evaluating Methods

1- Daily test and reports
2- Monthly exams and final exam .

C- Emotional and evolutional goals

Training the student to use different apparatus in the laboratory and develop research capacities to the students.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the skills mental abilities of the student
2. Dealing with laboratory work.

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Definition and characteristics of general enzymes and influencing factors Practical: general types of enzymes	Student understanding of the lesson	2 h. lect. 3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Definition and characteristics of general enzymes and influencing factors Practical: general types of enzymes	Student understanding of the lesson	2 h. lect. 3h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: The functions of enzymes practical: Amylase, Effect of temperature and pH on amylase	Student understanding of the lesson	2 h. lect. 3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: The functions of enzymes practical: Amylase, Effect of temperature and pH on amylase	Student understanding of the lesson	2 h. lect. 3h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: General enzyme composition Practical: catalase enzyme reaction test	Student understanding of the lesson	2 h. lect. 3h. lab.	5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films	Theoretical: General enzyme composition Practical:	Student understanding of the lesson	2 h. lect. 3h. lab.	6

	Practical application	catalase enzyme reaction test			
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Fermentation concept uses and benefits Practical: Oxidation and Reduction Enzymes ,liver enzyme test	Student understanding of the lesson	2 h. lect. 3h. lab.	7
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Fermentation concept uses and benefits Practical: Oxidation and Reduction Enzymes ,liver enzyme test	Student understanding of the lesson	2 h. lect. 3h. lab.	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Enzyme imbalance in the body Practical: Preparation of pancreatic juice and testing the activity of its enzymes in the laboratory	Student understanding of the lesson	2 h. lect. 3h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Enzyme imbalance in the body Practical: Preparation of pancreatic juice and testing the activity of its enzymes in the laboratory	Student understanding of the lesson	2 h. lect. 3h. lab.	10
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: semester exam Practical: preparing the intestinal juice and testing the activity of its enzymes in the laboratory	Student understanding of the lesson	2 h. lect. 3h. lab.	11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Theoretical: Models of enzyme-producing organisms, saponification test in fat digestion Practical : Practical semester exam	Student understanding of the lesson	2 h. lect. 3h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application		Student understanding of the lesson	2 h. lect. 3h. lab.	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application		Student understanding of the lesson	2 h. lect. 3h. lab.	15
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films		Student understanding of the lesson	2 h. lect. 3h. lab.	16

11- Infrastructure	
1- Textbooks required for the course	-enzymes structures - enzymes actions -enzymes disorder
2 References	Fundamentals of Enzymology by Wadih Saleh

	Practical application				
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					30

Recommended readings	Enzyme Therapy: Current Challenges and Future Perspectives
Electronic website	https://www.researchgate.net/deref/https%3A%2F%2Fwww.oercommons.org%2Fcourseware%2Frelated-esource%2F72191%2Fdownload

12. Course Development Plan
Depending on modern references and books . Scientific trips to laboratories and hospitals . Using and training of different lab apparatus .

Fourth Stage/ Plant tissue Culture B466

Course Description Form

THE COURSE AIMS TO DEFINE ONE OF IMPORTANT METHODSIN PLANT REPRODUCTIVE , SPECIALLY THE RARE AND DIFFECULTP PLANT , WITHOUT NEED FARMS OR SOIL , JUST INSIDE THE LABBORATORY

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	/ **Plant tissue Culture B466**
4. Programs included in	Bachelor's, Master's, Doctorate

5. Attendance Form Available	Weekly
6. Semester/ Year	2020-2021
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 17/9/2021

9. Aims of the Course

Develop the students ability to about the important methods for culturing the plant inside the laboratory begin from apiece of explants , sterilization , culturing , incubation , finally get a hole plant can alife out side the lab. to garden or farm

18.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

1- Define plant tissue culture to rare plants.

2- Explanin the stages of micropropagation.

3- Explain preparation of culture media inside lab.

4- Understand the important methods for sterilization in tissue culture lab.

5- Define the methods for plant tissue culture.

b- Subjective- Specific Skills

1- Indentify and under standing the plant tissue culture and design the lab.
2- Development the ability of students to culturing the plant inside lab .

Learning Methods

1. Explanation and Discussion of the Lectures
2- Research and reports from the students .

Evaluating Methods

1- Weekly test and reports 2- Monthly exams 3- Final exams
C- Emotional and evolutional goals 1- Ability to know ledge the important methods in tissue culture plant . 2- Knowledge how can plant develo ped in side the tube and in cubation .
d- General qualification skills transferred (other skills related to employability and personality development) 1. Developing the abilities of the student 2. Developing the skills 3. Exiperment in the laboratory and farm .

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

9. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Theoretical: Plant tissue culture technology, Important of tissue culture Stage of Micropropagation Practical: Explain the laboratory of plant tissue culturiy, sterilization , preparation of media	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	Theoretical: Establishment of organ and tissue culture The media of T . C . First semester exam practical: Problems of plant tissue culture , propagation of date palm . First semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	Theoretical: Plant Hormones Method of plant tissue culture Practical: propagation of potato carrot callus	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	Theoretical: Organogenisis Somatic Embrogenesis Practical: Dattora tissue culture Pollen and anther culture	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week, and 12th weeks	**2 h. lect. 2h. lab.**	Theoretical: Second semester exam Problem of tissue Culture Practical: Second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the**	**Daily and monthly tests**

		Garllic tissue culture		**laboratory**	
13 th week,	**2 h. lect. 2h. lab.**	Micropprolagation of date Palm	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Theoretical: Hydrograph , flood controls methods Practical : Practical semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure	
1- Textbooks required for the course Introduction to biotechnology date plant protocols	
Recommended readings lant and tissue organ culture	
Electronic website	

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

B465 – Serology- Fourth Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Serology- 465**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2020-2021**
6. Total of study hours	**Two hours of theory +two practical hour**
7. The course description was	**1-9-2020**

8. Aims of the Course

- **Define serology and types of serologic reactions**
- **Define the methods of antisera preparation**
- **Detection of pathogenic infections by serologic reactions and cellular clinical immunology**

- **Define blood banking tests .**

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

define the serum and antisera

define the types of serological reactions

define the serological tests which recognize immune complexes and infections

b- Skill objectives for the course

define serum and plasma , how the samples can prepared , define titer and titration , serial dilutions and sensitivity and specificity

Teaching and learning methods

Theoretical and practical lectures

Use of educational aids, presentations and scientific films

Practical application

Evaluation methods

Theoretical, semester and final exams

C- Emotional and value goals

The ability to communicate information after collecting and promising data

Linking information to human health and psychological reality

Preserve the wealth

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

Developing the mental abilities of the student

Knowing the health reality

10- The structure of the course					
Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Define the serology and mechanisms and types of serological reactions and method of antisera preparation	Student understanding of the lesson	2 h. lect. 2h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Antigen antibody reactions , agglutination, hemagglutination and precipitation	Student understanding of the lesson	2 h. lect. 2h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Immunoelectrophoresis and western blotting	Student understanding of the lesson	2 h. lect. 2h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Complement fixation test + labeling technique in immunoassay enzyme immunoassay	Student understanding of the lesson	2 h. lect. 2h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Radioactive binding technique	Student understanding of the lesson	2 h. lect. 2h. lab.	5
	EXAM				6

Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Fluorescent antibody technique+** **Complement +Nephlometry assays**	Student understanding of the lesson	2 h. lect. 2h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Laboratory methods for detection of cellular immunology** **Principle of Flowcytometry and clinical applications**	Student understanding of the lesson	2 h. lect. 2h. lab.	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Lymphocyte activation assays**	Student understanding of the lesson	2 h. lect. 2h. lab.	**9**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Monocyte / macrophage assays**	Student understanding of the lesson	2 h. lect. 2h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Neutrophil function assays**	Student understanding of the lesson	2 h. lect. 2h. lab.	**11**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Blood banking and immunohematology**	Student understanding of the lesson	2 h. lect. 2h. lab.	**12**
	EXAM				**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and	**Immunological mechanisms of blood transfusions**	Student understanding of the lesson	2 h. lect. 2h. lab.	**14**

	scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Fish tape worm	Student understanding of the lesson	2 h. lect. 2h. lab.	15
					17
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					30

11- Infrastructure	
Books • immunology and serology	**Required course books: *** * *

	* *
• practical immunology • immunology and serology • • clinical immunology	Main references (sources)- - -
	Books and references that he recommends (scientific journals, reports……)- - -
	Electronic references, websites- - -

12- Curriculum development plan

Implicit addition of new information within the main course contexts

Add new registered parasites

Fourth Stage/ Medical Mycology B467

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Medical Mycology B467
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2021-2020
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/09/2020

9. Aims of the Course

Develop the student's ability to recognize the importance of water resources, their presence, and distribution, environmental and economic importance. As well as recognize the sustainability methods and water balance methods to manage the drainage basins and the factors affecting on it

19.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Recognize the types fungal infections to human and animals.
a.2. Determination factors that increased the rate of fungal infections
a.3. Study the pathogenicity of pathogenic fungi
a.4. Determination the suitable treatment for each type of fungal infections
a.5. study the prevalence of fungal infections
a.6. To understand the mechanism of antifungals and specific targets effected in fungal cell
.

b- Subjective- Specific Skills

b.1. Determination the methods of isolation and identification of pathogenic fungi
b.2. Evaluation the ability of diagnosis for fungal infections
b.3. Identify and understanding the prevention of fungal infections

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

1- Daily test and reports
2- Monthly exams
2- Final exams

C- Emotional and evolutional goals

1. The ability to recognize the importance of water resource in earth system.
2. Linking knowledge to environmental reality.

Learning Methods

1. Explanation and Discussion of the Lectures
2. Boosting the student to conduct research and reports.
3. The student PowerPoint presentations.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the mental abilities of the student
2. Developing the skills
3. Dealing with field and laboratory
4. Monitoring and evaluating water resources in the environment and the impact of climate change.

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

10. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Theoretical: Historical introduction of medical mycology, method to classification of mycoses Practical: Properties of pathogenic fungi, portal of entry of fungi to host body	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	Theoretical: Superficial mycosis without invading living tissues practical: isolation and identification of Superficial mycosis without invading living tissues	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	Theoretical: Superficial mycosis with invading living tissues Practical: Study fungi that cause Superficial mycosis with invading living tissues	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	Theoretical: Dermatophytes and keratinophilic fungi Practical: Isolation , identification, and diagnosis of dermatophytosis and dermatomycosis	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week, and 12th weeks	**2 h. lect. 2h. lab.**	Theoretical: Subcutaneous mycosis Practical: Explain laboratory methods that used to isolation of keratiophilic fungi, study fungi that caused	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

		subcutaneous mycosis			
13 th week,	**2 h. lect. 2h. lab.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Theoretical: Systemic mycosis, laboratory methods to diagnosis of fungal infectionms Practical : Study systemic mycosis in lab	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure

1- Textbooks required for the course	
2 References	Brown GD, Netea MG, editors. Immunology of fungal infections. Dordrecht: Springer; 2007 May 10. Breitenbach M, Crameri R, Lehrer SB, editors. Fungal allergy and pathogenicity. Karger Medical and Scientific Publishers; 2002.
Recommended readings	Kavanagh K, editor. Medical mycology: cellular and molecular techniques. John Wiley & Sons; 2006 Aug 14.
Electronic website	

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

Course description form for the academic year 2021-2020

Course description: B490 490

Nanotechnology is the field which deals with the materials under nanoscale or nanometer nanotechnology can uses biological or chemical and physical method for preparation of nanoparticles or nanostructures also can use living organisms, or parts of them to develop or create different nanmaterials.

1- Educational institution	**University of Basrah**
2- Department / Center	**Department of Biology**
3- Course name / code	**B 490 - Nanotechnology**
4- Available forms of attendance	**Weakly**
5- Season / year	**2021 - 2020**
6- Number of hours of study (total)	**30 Hour**
7- The date of description	**14-8-2021**
8- Course objectives: **1- Understand the basic information and knowledge in nanotechnology preparation and applications.** **2 - Awareness of the role of nanotechnology in the development of life.** **3- The student acquires scientific and practical ability in the field of**	

nanotechnology

9- Program outcomes and methods of teaching, learning and assessment

A- Cognitive goals:

- Theoretical information and practical knowledge in nanotechnology applications.

- How is biotechnology play the role in the development of life.

- How the student get the scientific and practical ability in the field of nanotechnology

B- Course Skill objectives

- preparation of nanomaterials in different methods and procedures

-The use of various devices for the characterization of nanotechnology

Teaching and learning methods:

- Live explanation and use of Power Point slides.

- Use pictures and templates.

- Laboratory equipment.

Evaluation methods:

- **Daily exams (Quiz)**
- **Reports**
- **Monthly exams**

Emotional and value goals:

- **The ability to deliver information**
- **Learn about recent developments in the field of nanotechnology**
- **The ability to explain things using the science of nanotechnology**

Transferred general and qualification skills (other skills related to employability and personal development):

- **Developing the student's mental abilities.**
- **Developing the student's skill abilities.**
- **How to handle laboratory equipment and sample preparation.**

10- Course structure

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Weak
Questions, discussion and reports	Classroom or electronic lectures	Definition of nanotechnology, history of development of nanotechnology, needs of nanotechnology, ancient nanotechnology, modern nonotechnology			1

		Types of nanotechnology classifications, areas of nanotechnology, importance and benefits of nanotechnology, applications of nanotechnology, timetable for the development of nanotechnology.			**2**
		Biological nanomaterial preparation method			**3**
		Chemical nanomaterial preparation method			**4**
		Physical nanomaterial preparation method			**5**
		Monthly Exam			**6**
		Green synthesis methods			**7**
		Characterization methods			**8**
		Application ways			**9**
		Medical applications			**10**
		Industrial applications			**11**
		Monthly Exam			**12**
		Diagnostic Applications			**13**
		Pathological analysis application .			**14**
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11- Infrastructure	
Books:	**Required course books:** * * * * *
	Main references (sources): **1- Murty & Murday**

	(2013). Textbook of nanoscience and nanotechnology. **2- Bhushan, B. (2017). Introduction to nanotechnology.** **3- Sheikh, (2020). Application of Nanotechnology in Biomedical Sciences. Springer.**
	Books and references that he recommends (scientific journals, reports……) **-** **-** **-**
	Electronic references, websites

12- Curriculum development plan **Relying on modern sources**

fourth Stage/ Animal tissue culture B483

Course Description Form

This course provides students with the skills and knowledge to work in a modern biological research laboratory making use of cell culture techniques. Emphasis is placed on aseptic

techniques for animal cell culture, the requirements for cell growth in vitro, mechanisms underlying cellular differentiation, immunohistochemistry and in situ hybridization, and the expression of transfected DNA in cultured animal cells

1.Educational Institution	College of Science / University of Basrah
2. Department	Biology

20.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Tissue culture is an important tool for the study of the biology of cells from multicellular organisms.

a.2. It provides an in vitro model of the tissue in a well-defined environment that can be easily manipulated and analyzed.

a.3. Recognize the types of normal and transformed cell lines

a.4. To develop the ability of the students to identify the animal cell culture in vitro

a.5. To Identify the basic equipment and facilities in animal cell culture

a.6. Identify the basic techniques in animal cell culture.

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8. Th

b- Subjective- Specific Skills

9. Aim

b.1.Recognize the sources of cell lines .

b.2. Acquiring the skills of calculating the cytotoxicity and analyzing its results

Dev and i main

b.3. Identity and understanding of Maintaining cell culture methods and how to achieve them.

in which animal cell culture is used and the factors affecting on it.

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

1- Daily test and reports
2- Monthly exams
2- Final exams

C- Emotional and evolutional goals

1. The ability to recognize the importance of animal cell culture in the biology field.
2. Linking knowledge to a healthy reality
3-Apply biological and chemical principles and quantitative reasoning to concepts presented in core subject areas in Animal Science such as physiology, nutrition, genetics, and reproduction

Learning Methods

1. Explanation and Discussion of the Lectures
2. Boosting the student to conduct research and reports.
3. The student PowerPoint presentations.

d- General qualification skills transferred (other skills related to employability and personality development)

1. Developing the mental abilities of the student
2. Developing the skills
3. Dealing with field and laboratory

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

11. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h.lect.**	Theoretical: General introduction, History of Tissue / Cell Culture, Importance of and progress in Animal Cell Culture Technology, initiation of culture, culture condition , Cell Preservation , Cells Morphology in culture, Biology of the Cultured Cell	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect.**	Theoretical: Basic Manipulations of Cultured Cells , Demonstration of sterile method & lab setup , plating cell. The Culture Environment	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week	**2 h. lect.**	First semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
8th weeks	**2 h. lect.**	Theoretical: Culture media of animal cells: Serum and Serum Free Media, Cell metabolism and its control in culture media, Culturing and Sub-Culturing of Animal Cells, Monitoring and control of cell culture	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect.**	Theoretical: Guidelines for maintaining culture cells, Cell Differentiation & Cell Movement	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11 th week, and 12th weeks	**2 h. lect.**	Theoretical: Biological contamination of cell cultured , types of contamination	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
13 th week,	**2 h. lect.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect.**	Theoretical: Application of cell culture in different biological field	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure	
1- Textbooks required for the course	
2 References	* Culture of Animal Cells, A manual of basic technique, 5th Edi on by Freshney, RI. WIELY-LISS,2005(optional)
Recommended readings	Invitrogen. (2010). Cell Culture Basics Handbook. ThermoFisher Scientific Inc., 1–61. https://doi.org/10.1093/chemse/bjt099
Electronic website	Cell culture training video https://www.youtube.com/watch?v=WGKoJRNKADY

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

B412 –plant physiology- fourth Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**plant physiology –B412**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2020-2021**
6. Total of study hours	**Two hours of theory +Two practical hour**
7. The course description was	**2020-2021**

8. Aims of the Course

- **Explained and describe the principles of plant physiology**
- **Study the functions of plant organs and plant cell.**

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

- **Explained the water relations and The importance of water for plant**
- **Study factors affecting transportation**
- **Study of photosynthesis processes and Photorespiration**
- **Learn the most important of metabolic pathways**

b- Skill objectives for the course

- **Acquisition of physiological view related with the functions of plant organs and cell. and how to grow a plant**

Teaching and learning methods

Theoretical and practical lectures

Using of educational aids, presentations and scientific films

Practical application

Evaluation methods

Theoretical, semester and final exams

C- Emotional and value goals

- **The ability to communicate information after collecting and promising data**
- **Linking information to how to grow a plant and adapt to their environments**

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)

Developing the mental abilities of the student

Dealing with equipment used in laboratories of plant physiology

10- The structure of the course

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Water characteristic	Student understanding of the lesson	2 h. lect. 2h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Characteristics of solutions	Student understanding of the lesson	2 h. lect. 2h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Water relation ships	Student understanding of the lesson	2 h. lect. 2h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and	Method for measuring the potential of solutions	Student understanding of the lesson	2 h. lect. 2h. lab.	4

	scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Method for measuring the potential of plant cells**	Student understanding of the lesson	2 h. lect. 2h. lab.	**5**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Assignment 1	Student understanding of the lesson	2 h. lect. 2h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Transpiration Absorption**	Student understanding of the lesson	2 h. lect. 2 h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**mechanism of stomata opening and closing**	Student understanding of the lesson	2 h. lect. 2h. lab.	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**photosynthesis processes**	Student understanding of the lesson	2 h. lect. 2h. lab.	**9**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**C3 ,C4 and CAM PLANTS**	Student understanding of the lesson	2 h. lect. 2h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	**Photorespiration**	Student understanding of the lesson	2 h. lect. 2h. lab.	**11**

	presentations and scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Assignment 2**	Student understanding of the lesson	2 h. lect. 2h. lab.	**12**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Carbohydrate Metabolism**	Student understanding of the lesson	2 h. lect. 2h. lab.	**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Glycolysis**	Student understanding of the lesson	2 h. lect. 2h. lab.	**14**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**krebs cycle**	Student understanding of the lesson	2 h. lect. 2h. lab.	**15**
					16

11- Infrastructure	
books: **plant physiology of Abd-Alathem**	**Required course books: *** * * * *

general plant physiology	**Main references (sources)-** **-** **-**
Introduction to Plant Physiology by Meyer et al.	**Books and references that he recommends (scientific journals, reports……)-** **-** **-**
plant physiology in web **http://pse.mu.edu.iq/wp-**	**Electronic references, websites-** **-** **-**

12- Curriculum development plan
Implicit addition of new information within the main course contexts

Course description form for the academic year 2021-2022

Course description: B464

Biotechnology is technology that uses biological systems, living organisms, or parts of them to develop or create different products. Therefore, the biotechnology course aims to introduce the student to the history of this science and the most important achievements that this science has provided to humanity, in addition to the getting acquainted in some detail with a group of modern technologies used in this specialization.

1- Educational institution	**University of Basrah**
2- Department / Center	**Department of Biology**

3- Course name / code	**B 464 – Biotechnology**
4- Available forms of attendance	**Weakly**
5- Season / year	**2021 - 2020**
6- Number of hours of study (total)	**30 Hour**
7- The date of description	

8- Course objectives:

1- Understand basic information and knowledge in biotechnology applications.

2 - Awareness of the role of biotechnology in the development of life.

3- The student acquires scientific and practical ability in the field of biotechnology

9- Program outcomes and methods of teaching, learning and assessment

A- Cognitive goals:

- Understand basic information and knowledge in biotechnology applications.

- Awareness of the role of biotechnology in the development of life.

- The student acquires scientific and practical ability in the field of biotechnology

B- Course Skill objectives

- DNA extraction in different ways

- The use of various devices for the specialization of biotechnology

Teaching and learning methods:

- Live explanation and use of Power Point slides.

- Use pictures and templates.

- Laboratory equipment.

Evaluation methods: **- Daily exams (Quiz)** **- Reports** **- Monthly exams**
Emotional and value goals: **- The ability to deliver information** **- Learn about recent developments in the field of biotechnology** **- The ability to explain things using the science of biotechnology**
Transferred general and qualification skills (other skills related to employability and personal development): **- Developing the student's mental abilities.** **- Developing the student's skill abilities.** **- How to handle laboratory equipment and sample preparation.**

10- Course structure

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Weak
Questions, discussion and reports	Classroom or electronic lectures	Definition of biotechnology, stages of development of biotechnology, emergence of biotechnology, classical biotechnology, modern biotechnology			1
		Types of biotechnology, areas of biotechnology, importance and benefits of biotechnology, applications of biotechnology, timetable for the development of biotechnology.			2
		DNA extraction			3
		Electrophoresis of Nucleic Acids			4
		Principles of PCR Technique			5
		Monthly Exam			6
		Types of PCR			7
		The use of DNA to identify			8

		humans			
		Microorganism isolation methods			**9**
		Major products in biotechnology			**10**
		Sequencing			**11**
		Monthly Exam			**12**
		Nanobiotechnology Applications			**13**
		Applications of Nanotechnology in Diagnosis .			**14**
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11- Infrastructure	
Books:	**Required course books:** * * * * *
	Main references (sources): **1-A Text Book of Biotechnology, R.C. Duby (2007)**

	2-An Introduction to Biotechnology, W.T. Godbey (2014) **3- Applications of Nanotechnology, A.M.Al-Obaidi (2012)s**
	Books and references that he recommends (scientific journals, reports……) **-** **-** **-**
	Electronic references, websites

12- Curriculum development plan **Relying on modern sources**

Course description form for the academic year 2021-2020

Course description :

The hematology course aims to give a general idea of the basics of hematology, its definition, importance and functions, its components, the stages of development and growth of different blood cells, as well as identifying the various genetic and non-hereditary blood diseases that may affect blood-forming cells with a focus on blood cell diseases. red and white. As well as knowledge of the various laboratory tests related to blood diseases.

1- Educational institution	**University of Basrah**
2- Department / Center	**Department of Biology**
3- Course name / code	**B 473 – Hematology**
4- Available forms of attendance	**Weakly**
5- Season / year	**2021 - 2020**
6- Number of hours of study (total)	**30 Hour**
7- The date of description	
8- Course objectives: **- Learn about the normal components of blood and their functions**	

- Study of diseases resulting from imbalance in the proportions of blood components and methods of treatment

9- Program outcomes and methods of teaching, learning and assessment

A- Cognitive goals:

- Learn about blood components and their functions
- Studying the composition of blood components in the red bone marrow
- Identify genetic and non-genetic diseases resulting from defects in the proportions of blood components

B- Course Skill objectives

- Benefiting from the basics of the scientific material to understand and keep pace with the scientific development in the field of hematology and its practical applications
- Learn about the technique of blood drawing and methods of transporting and preserving samples.
- Familiarity with all laboratory methods for detection and diagnosis of blood-related diseases

Teaching and learning methods:

- Live explanation and use of Power Point slides.
- Use pictures and templates.
- Laboratory equipment.

Evaluation methods:

- Daily exams (Quiz)
- Reports
- Monthly exams

Emotional and value goals:

1- The ability to communicate information
2- Learn about recent developments in the field of hematology
3- The ability to explain the changes that occur in the blood parameters compared to the normal values

4- The ability to explain the emergence of diseases and ways to treat them
Transferred general and qualification skills (other skills related to employability and personal development): **- Developing the student's mental abilities.** **- Developing the student's skill abilities.** **- How to handle laboratory equipment and sample preparation.**

10- Course structure

Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Weak
Questions, discussion and reports	Classroom or electronic lectures	Introduction to the basics of hematology, physical characteristics of blood, its definition, importance, components, functions, stages of development and growth of different blood cells			1
		Red blood cells: their genesis and development (growth and maturation), their shape (normal and abnormal) and content, function, normal values, their breakdown. Pathological factors associated with an increase or decrease in their number of different types.			2
		Types of anemia, causes and treatment			3
		White blood cells: their genesis, types and functions, normal values, pathological factors associated with an increase or decrease in their number of different types			4
		Platelets, composition, stages			5

		of development, structure of platelets, functions			
		Monthly Exam			**6**
		The formation of the platelet plug, the coagulation process, the detailed events of the coagulation process			**7**
		Clot Retraction and Repair, Inhibition of Clotting Factors			**8**
		Hemostasis Disorders: Thromboembolytic Conditions, Hemostasis Disorders: Bleeding Disorders			**9**
		Blood transfusions, blood groups, hemolysis in newborns.			**10**
		Diagnostic Blood Tests			**11**
		Monthly Exam			**12**
		Alpha Thalassemia			**13**
		Beta Thalassemia			**14**
		Diabetes and its types			**15**
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11- Infrastructure	
Books:	**Required course books:**

Essential of Hematologyss	*** * * * ***
	Main references (sources): Essential of Hematology
	Books and references that he recommends (scientific journals, reports……) - - -
	Electronic references, websites

12- Curriculum development plan Relying on modern sources

B414 – Virology- fourth Stage

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Virology - B414**

4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2022-2023**
6. Total of study hours	**Two hours of theory +one practical hour**
7. The course description was	**1-9-2023**

8. Aims of the Course

1. **To develop students' understanding of virology.**
2. **To assist students in diagnosing viral diseases.**
3. **To work with the help of students on how to deal with viral epidemics.**
4. **To know the pathogenicity of viruses.**
5. **To know the genetic variations in viruses.**
6. **To know viral diseases.**

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

Assist students in diagnosing viral diseases

b- Skill objectives for the course

Acquisition of virological diagnosis skills

Control of its transmission routes

prevention
Teaching and learning methods Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application
Evaluation methods Theoretical, semester and final exams
C- Emotional and value goals The ability to communicate information after collecting and promising data Linking information to human health and psychological reality Preserve the wealth
D- Transferred general and rehabilitative skills (other skills related to employability and personal development) Developing the mental abilities of the student Knowing the health reality

10- The structure of the course					
Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Basic concepts and structures of viruses**	Student understanding of the lesson	2 h. lect. 3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and	**viral morphology and symmetry**	Student understanding of the lesson	2 h. lect. 3h. lab.	2

	scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Viral replication**	Student understanding of the lesson	2 h. lect. 3h. lab.	**3**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Viral genome evolution**	Student understanding of the lesson	2 h. lect. 3h. lab.	**4**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Host immune responses**	Student understanding of the lesson	2 h. lect. 3h. lab.	**5**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Pathogenesis**	Student understanding of the lesson	2 h. lect. 3h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Classification of viruses**	Student understanding of the lesson	2 h. lect. 3h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Pathogenic viruses of Human :DNA Viruses**	Student understanding of the lesson	2 h. lect. 3h. lab.	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	**Viruses with Single-Stranded DNA;**	Student understanding of the lesson	2 h. lect. 3h. lab.	**9**

	presentations and scientific films Practical application	**Parvoviridae**			
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Viruses with Double-Stranded DNA; Adenoviridae, Papillomaviridae, Polyomaviridae,.**	Student understanding of the lesson	2 h. lect. 3h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Herpesviridae, Poxviridae and Hepadnaviridae**	Student understanding of the lesson	2 h. lect. 3h. lab.	**11**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**RNA :Viruses** **Positive single-stranded RNA Viruses; Picornaviridae, Astroviridae, Caliciviridae,**	Student understanding of the lesson	2 h. lect. 3h. lab.	**13**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**exam**	Student understanding of the lesson	2 h. lect. 3h. lab.	**14**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Togaviridae, Flaviviridae, Coronaviridae and Retroviridae**	Student understanding of the lesson	2 h. lect. 3h. lab.	**15**
Daily and monthly tests	Theoretical and practical lectures	**Double-Stranded RNA**	Student understanding of the lesson	2 h. lect. 3h. lab.	**16**

	Use of educational aids, presentations and scientific films Practical application	viruses; Reoviridae			
		Negative single- viruses stranded RNA; Orthomyxoviridae, Bunyaviridae, Arenaviridae, Paramyxoviridae, Rhabdoviridae and Filoviridae			17
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11- Infrastructure	
Introduction to Modern Virology: N. J. • •	Required course books: *

Dimmock, A. J., Easton and K. N. Leppard. Copyright .Year: 2007	* * * *
,HUMAN VIROLOGY, Hayder Abdulhussein Al-Hmudi • • Al-Ghadeer Company for Printing and Publishing Ltd	Main references (sources)- - -
	Books and references that he recommends (scientific journals, reports……)- - -
https://samicrobiology.files.wordpress.com/2018/08/modern-viro1ogy.pdf	Electronic references, websites- - -

12- Curriculum development plan
Implicit addition of new information within the main course contexts Add new registered fungi

Fourth Stage/ Fungal physiology B486

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3. Course name/Code 1. Programs included in it	Fungal physiology B486
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2021-2022
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 15/08/2022
9. Aims of the Course	
• Description of fungal cell with function of each organelles of it • Study of growth and growth rate of fungal cells • Study of nutrition requirements of fungi • Learn growth measurement methods • Knowledge of the influence of environmental conditions on fungal growth. • Study of important of spores in life cycle of fungi	

- Study of reproductive physiology in different groups of fungi
- Study of fungal metabolic influence and diagnostic ability of fungal metabolites
- Extracted of secondary fungal metabolites
- Study the mycotoxins as type of secondary metabolites
- Study the mechanism of action of antifungal on fungal cell

a- Knowledge and Understanding goals

A.1.General characterization of fungal cell.
A.2.Evaluation the important of each part in fungal cell.
A.3. Study the composition of cell wall in fungi with knowledge of their function and important.
A.4. Study water activity and their effect of life cycle of fungi.
A.5. Understanding the effect of environmental factors on fungi and their properties.
A.6. To understand apical growth and their requirements on fungal cell.

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b- Subjective- Specific Skills

B.1. Define the growth curve of fungal cell with distinguishes the important of their phases of fungal life cycle.
B.2. Recognize the nutritional requirements of fungal growth
B.3. Study the influence of genetic and hormonal factors of fungal reproduction in different groups of fungi in addition to effect of environmental factors of fungal distribution.
B.4 Study the important of spores in fungi and their dormancy, activation, and germination.
B.5 Study the fungal metabolites (primary and secondary) with their important.
B.6 Explanation the mycotoxins and their types and effect.
B.7. Study the classification of antifungals and their mod of action in fungal cell.

Learning Methods

1. Explanation and Discussion of the Lectures
2. It is boosting the student to conduct research and reports.
3. Urging the student to make PowerPoint presentations.

Evaluating Methods

1- Daily test and reports 2- Monthly exams 2- Final exams
C- Emotional and evolutional goals 1. The ability to recognize the importance of water resource in earth system. 2. Linking knowledge to environmental reality.
Learning Methods
1. Explanation and Discussion of the Lectures 2. Boosting the student to conduct research and reports. 3. The student PowerPoint presentations.
d- General qualification skills transferred (other skills related to employability and personality development) 1. Developing the mental abilities of the student 2. Developing the skills 3. Dealing with field and laboratory 4. Monitoring and evaluating methods of fungal growth calculation.

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

12. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Theoretical: General introduction, definition of kingdom of fungi, their properties and parts pf fungal cells, Explanation of the function and important of each part of fungal cell Practical: Studying fungal growth and fungal growth rate with determination of methods that used to measure growth rate	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	Theoretical: Definition of growth and growth rate with main hypothesis that explain the mechanism of apical growth in filamentous fungi practical: study the fungal growth curve and laboratory experiments to determine fungal growth rate according to colony diameter and dry weight	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	Theoretical: Study the environmental factors affected on fungal growth Practical: Effect of environmental factors on fungal growth (temperature, pH, nutrition, salinity)	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	Theoretical: Evaluation nutritional requirements for fungal growth Practical: Experimental study to determine and extraction of secondary metabolites from fungi with their applications in different fields	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week, and 12th weeks	**2 h. lect. 2h. lab.**	Theoretical: Spores, dormancy, activation, and germination, reproduction physiology of fungi Practical: Study the ability of some fungal species to produce mycotoxins	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
13 th week,	**2 h. lect. 2h. lab.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Theoretical: Mycotoxins ,antifungals and their mode of action. Practical : that inhibited fungal growth	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the laboratory**	**Daily and monthly tests**

11. Infrastructure

1- Textbooks required for the course	
2 References	• Deacon J. Fungal biology. 4th ed. MA, USA: Blackwell Publishing; 2006. Di Iaconi C, Ramadori R, Lopez A, Passino R. Influence of

	hydrodynamic shear forces on properties of granular biomass in a sequencing batch biofilter reactor. Biochem Eng J 2006;30:152–7. • Garraway MO, Evans RC. Fungal nutrition and physiology. New York: Wiley; 1984 Jan.
Recommended readings	Griffin DH. Fungal physiology. John Wiley & Sons; 1996 Jun 22.
Electronic website	

12. Course Development Plan
Course development based on recent versions of books and references.. The adoption of modern interactive teaching methods. Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

Fourth Stage/ Medical Mycology B467

Course Description Form

The course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the available learning opportunities.

1.Educational Institution	College of Science/ University of Basrah

2. Department	Biology
3. Course name/Code 1. Programs included in it	Medical Mycology B467
4. Programs included in	Bachelor's, Master's, Doctorate
5. Attendance Form Available	Weekly
6. Semester/ Year	2021-2022
7. Total of study hours	30 hours + 60 practical hours
8. The course description was	prepared in 01/09/2020

9. Aims of the Course

Develop the student's ability to recognize the importance of water resources, their presence, and distribution, environmental and economic importance. As well as recognize the sustainability methods and water balance methods to manage the drainage basins and the factors affecting on it

21.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

a.1. Recognize the types fungal infections to human and animals.
a.2. Determination factors that increased the rate of fungal infections
a.3. Study the pathogenicity of pathogenic fungi
a.4. Determination the suitable treatment for each type of fungal infections
a.5. study the prevalence of fungal infections
a.6. To understand the mechanism of antifungals and specific targets effected in fungal cell
.

b- Subjective- Specific Skills

b.1. Determination the methods of isolation and identification of pathogenic fungi

b.2. Evaluation the ability of diagnosis for fungal infections

b.3. Identify and understanding the prevention of fungal infections

Learning Methods
1. Explanation and Discussion of the Lectures 2. It is boosting the student to conduct research and reports. 3. Urging the student to make PowerPoint presentations.
Evaluating Methods
1- Daily test and reports 2- Monthly exams 2- Final exams
C- Emotional and evolutional goals 1. The ability to recognize the importance of water resource in earth system. 2. Linking knowledge to environmental reality.
Learning Methods
1. Explanation and Discussion of the Lectures 2. Boosting the student to conduct research and reports. 3. The student PowerPoint presentations.
d- General qualification skills transferred (other skills related to employability and personality development) 1. Developing the mental abilities of the student 2. Developing the skills 3. Dealing with field and laboratory 4. Monitoring and evaluating water resources in the environment and the impact of climate change.

B413 – Plant pathology- Fourth Stage

Course Description Form

In this course on the subject of plant pathology, it begins by providing an overview of the origins and development of this field and the importance of its study. Additionally, it clarifies some concepts within this field related to the emergence and development of plant diseases, explaining the role of the inoculum in causing plant diseases and outlining the types of inoculum and their methods of spread. Furthermore, it explains the steps of infection, starting from the arrival of the inoculum and the penetration of the host, leading to disease development and the appearance of pathological symptoms. Following this, it illustrates the signs and symptoms of plant diseases, elucidates the severity of infection, and discusses the percentage of plant disease occurrence, depending on the symptoms. Subsequently, it delves into the plant's response to the pathogen, both from a structural and chemical perspective, and seeks ways to control plant diseases.

1.Educational Institution	**College of Science/ University of Basrah**
2. Department	**Biology**
3- Name/code of the course	**Plant pathology –B413**
4. Attendance Form Available	**Weekly**
5. Semester/ Year	**2020-2021**
6. Total of study hours	**Two hours of theory +one practical hour**
7. The course description was	**1-9-2021**
8. Aims of the Course	

Learn about plant diseases and their importance

Identify biotic and abiotic causes

Identify the types of special substances that cause diseases in plants

Recognize the types of plant symptoms

Learn about the defenses the plant uses against pathogens

9.Course outcomes and methods of teaching, learning and assessment

a- Knowledge and Understanding goals

Knowledge about plant diseases and their importance, identify biotic and abiotic causes, recognize types of substances causing plant diseases, and understand plant defense mechanisms against pathogens.

b- Skill objectives for the course

Acquire skills to diagnose plant diseases and their methods of transmission and control

Teaching and learning methods

Theoretical and practical lectures

Use of educational aids, presentations and scientific films

Practical application

Evaluation methods

Theoretical, semester and final exams

C- Emotional and value goals

The ability to communicate information after collecting and promising data

Linking information to human health and psychological reality

Preserve the wealth

D- Transferred general and rehabilitative skills (other skills related to employability and personal development)
Developing the mental abilities of the student Knowing the health reality

10- The structure of the course					
Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Introduction - History of Plant Pathology- Losses Caused by Plant Diseases	Student understanding of the lesson	2 h. lect. 3h. lab.	1
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Host Range of Pathogens- The relationship between host and pathogen	Student understanding of the lesson	2 h. lect. 3h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	division of plant diseases	Student understanding of the lesson	2 h. lect. 3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Genetics of Plant Disease	Student understanding of the lesson	2 h. lect. 3h. lab.	4
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and	Exam	Student understanding of the lesson	2 h. lect. 3h. lab.	5

	scientific films Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Signs of disease**	Student understanding of the lesson	2 h. lect. 3h. lab.	**6**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Symptoms of the disease**	Student understanding of the lesson	2 h. lect. 3h. lab.	**7**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Inoculation- Types of Inoculum**	Student understanding of the lesson	2 h. lect. 3h. lab.	**8**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Exam**	Student understanding of the lesson	2 h. lect. 3h. lab.	**9**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Dissemination of the Pathogen- Dissemination by Humans**	Student understanding of the lesson	2 h. lect. 3h. lab.	**10**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Development of Disease in Plants Stages in the Development of Disease**	Student understanding of the lesson	2 h. lect. 3h. lab.	**11**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	**How Plants Defend Themselves Against**	Student understanding of the lesson	2 h. lect. 3h. lab.	**13**

	presentations and scientific films Practical application	**Pathogens**			
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Preexisting Structural Defenses-post infection**	Student understanding of the lesson	2 h. lect. 3h. lab.	**14**
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	**Chemical Defenses - Preexisting Chemical Defenses-post infection- The control of Plant disease**	Student understanding of the lesson	2 h. lect. 3h. lab.	**15**
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11- Infrastructure	
(Plant Pathology) George N. Agrios	Main references books: * * * * *
(Introduction to plant pathology) Richard N. Strnge	Main references (sources)- - -
	Books and references that he recommends (scientific journals, reports……)- - -
	Electronic references, websites- - -

12- Curriculum development plan

Implicit addition of new information within major course contexts,Add everything that contributes to increasing knowledge of plant diseases.

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the description of the program.

13. **Sequencing of course content**

Week	Hours	Unit name	Course Outcomes	Learning method	Evaluation method
1 st week, 2ed, 3ed weeks	**2 h. lect. 2h. lab.**	Theoretical: Historical introduction of medical mycology, method to classification of mycoses Practical: Properties of pathogenic fungi, portal of entry of fungi to host body	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
4 th week, 5 th and 6th weeks	**2 h. lect. 2h. lab.**	Theoretical: Superficial mycosis without invading living tissues practical: isolation and identification of Superficial mycosis without invading living tissues	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
7 th week, and 8th weeks	**2 h. lect. 2h. lab.**	Theoretical: Superficial mycosis with invading living tissues Practical: Study fungi that cause Superficial mycosis with invading living tissues	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
9 th week, and 10th weeks	**2 h. lect. 2h. lab.**	Theoretical: Dermatophytes and keratinophilic fungi Practical: Isolation , identification, and diagnosis of dermatophytosis and dermatomycosis	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
11 th week, and 12th weeks	**2 h. lect. 2h. lab.**	Theoretical: Subcutaneous mycosis Practical: Explain laboratory methods that used to isolation of keratiophilic fungi, study fungi that caused	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

		subcutaneous mycosis			
13 th week,	**2 h. lect. 2h. lab.**	second semester exam	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**
14 th week, and 15th weeks	**2 h. lect. 2h. lab.**	Theoretical: Systemic mycosis, laboratory methods to diagnosis of fungal infectionms Practical : Study systemic mycosis in lab	**Knowledge and understanding of lectures**	**Understand the evolving state of knowledge learn to carry out practical work, in the field and in the laboratory**	**Daily and monthly tests**

11. Infrastructure

1- Textbooks required for the course	
2 References	Brown GD, Netea MG, editors. Immunology of fungal infections. Dordrecht: Springer; 2007 May 10. Breitenbach M, Crameri R, Lehrer SB, editors. Fungal allergy and pathogenicity. Karger Medical and Scientific Publishers; 2002.
Recommended readings	Kavanagh K, editor. Medical mycology: cellular and molecular techniques. John Wiley & Sons; 2006 Aug 14.
Electronic website	

12. Course Development Plan

Course development based on recent versions of books and references..
The adoption of modern interactive teaching methods.
Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.