

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 2021/2022

University: Basra

College/Institute: Sciences

Scientific Department: Life Sciences

Date of filling the file: 09/15/2021

التوقيع :
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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 institution 1	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															Basic or facultative	Course Name	Course code
Physical and Engineering skills Transfer skills needed to employability and Personal development		Emotional and Value goals				Skills objectives of the program				Cognitive objectives							
														D2	D1	C4	C3
	√	√		√	√	√	√	√	√	√	√	√	√	√	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
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultative	Medical bacteria	B341

															ive		
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Clinical Chemistry	Ch34
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Medical entomology	B362
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Aquatic plant	B356
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Aquatic ecology	B373
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Medical plant	B378
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	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
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Virology	B414
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Serology	B465
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Plant diseases	B413
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Aquatic animal physiology	B431
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Environmental ecology	B430
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Archgonate	B455
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Biotechnology	B464
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Plant tissue culture	B466
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	Biological control	B468
√	√		√	√	√	√	√	√	√	√	√	√	√	√	Facultat ive	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	2021-2022
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 outcome	Hours	Week
Daily and monthly tests	Theoretical and practical lectures Use of educational aids,	animal cell and tissues Form and functions. Cell membrane, cytoplasm, neoclus, golgi	Student understand	3 h. lect. 3h. lab.	1

	presentations and scientific films Practical application	bodies, lysosomes, mitochondria, cytoskeleton	ding of the lesson		
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 monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Plant tissue: Internal structure of the plant organs.	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	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://wikibooks.com 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
<p>a- Knowledge and Understanding goals Academic objectives of the course "PRINCIPLES OF ECOLOGY (B105)" concerning with the understanding of the followings:</p> <p>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.</p> <p>a.2. Population ecology (structural and functional characteristics of the population and inter-specific relationships)</p> <p>a.3. Community ecology (structural and functional characteristics of the biotic communities) and the major terrestrial biotic communities (the biomes).</p> <p>a.4. Laboratory methods and instruments used to measure the main physical and chemical variables that affect an ecosystem.</p>
<p>b- Subjective- Specific Skills</p> <p>b.1.Gaining theoretical experience in the principles of ecology to explain and philosophy of environmental phenomena</p> <p>2- Gaining theoretical and practical experience to measure the physical and chemical variables affecting the ecosystem</p>
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
2 nd 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
3 rd 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
4 th 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
6 th 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

7 th week,	2 h. lect. 2h. lab.	First examination	-----	-----	-----
8 th 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
9 th 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
10 th 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
11 th 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
12 th 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

13 th 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.				
15 th week,	2 h. lect. 2h. lab.	Theoretical: Human Activities and their Impact on Environment	Understanding of lectures	Use of educational aids	Daily and monthly tests
2 References			Cunningham,W.P ; Cunningham,M.A and Saigo,B.W. (2007) : Environmental science a global concern , ninth edition , Mc		
		Nutrients (Nitrates &Phosphates)			

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

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
<p>8. Aims of the Course</p> <p>1-Defining the types of plant tissues that make up the plant body .</p> <p>2- learn about the specification and function of each tissue .</p> <p>3- Introducing the modification that occure in plants when they exposed to unsuitable conditions .</p> <p>4- Knowing the relationship between the plant and its environment anatomically</p>	

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

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 tissue 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
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					30

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

<ul style="list-style-type: none"> • 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	2021-2022
6. Total of study hours	Three hours of theory +one practical hour
7. The course description was	1-9-2021
<p>8. Aims of the Course</p> <p>This part aimed to develop the ability of students to diagnosed variable Cells in the tissue sections microscopically .</p> <p>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.</p>	
9. Course outcomes and methods of teaching, learning and assessment	
<p>a- Knowledge and Understanding goals</p> <p>Recognize the types of fungi and taxonomy</p>	
<p>b- Skill objectives for the course</p> <p>Acquisition of Cytological diagnosis cells</p>	

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

<p style="text-align: center;">2- Junqueira's Basic Histology TEXT AND ATLAS , Anthony L. Mescher, PhD, 2018</p> <p style="text-align: center;">3- Cell Biology , David Priscot</p> <p style="text-align: center;">3- Lectures power points</p>	<p style="text-align: right;">*</p> <p style="text-align: right;">*</p> <p style="text-align: right;">*</p> <p style="text-align: right;">*</p>
	<p style="text-align: right;">Main references (sources)-</p> <p style="text-align: right;">-</p> <p style="text-align: right;">-</p>
	<p style="text-align: right;">Books and references that he recommends (scientific journals, reports.....)-</p> <p style="text-align: right;">-</p> <p style="text-align: right;">-</p>
	<p style="text-align: right;">Electronic references, websites-</p> <p style="text-align: right;">-</p> <p style="text-align: right;">-</p>

<p>12- Curriculum development plan</p> <p>Implicit addition of new information within the main course contexts</p> <p>Add new registered fungi</p>
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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	2021-2022
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	
<p>Develop the student's knowledge about the bacteria and how 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 how 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.</p>	

10.Course outcomes and methods of teaching, learning and assessment
<p>a- Knowledge and Understanding goals</p> <p>a.1. Recognize the types of three domain's including bacteria</p> <p>a.2. How the microbial world start and then developed by mention some of experiment by scientist.</p> <p>a.3. To develop the ability of the students to identify the bacterial structure.</p> <p>a.4. To Identify the physical and chemical such as temperature, pH and nutritional factors that effect on bacterial growth</p> <p>a.5. Identify the sustainability topics and management of bacterial dynamics of bacterial growth curve.</p> <p>a.6. To how to control on bacterial contamination or infection by sterilization or antibiotics</p> <p>a.7. Some information about the most frequent bacteria in the nature and in the clinical.</p> <p>.</p>
<p>b- Subjective- Specific Skills</p> <p>b.1. Recognize how to isolate and identify bacteria.</p> <p>b.2. Acquiring the skills of calculating the generation time of bacteria</p> <p>b.3. Identify and understanding of sustainability methods and how to achieve them.</p>
Learning Methods
<p>1. Explanation and Discussion of the Lectures</p> <p>2. It is boosting the student to conduct research and reports.</p> <p>3. Doing a short exam during the lecture.</p>
Evaluating Methods
<p>1- Daily test and reports</p> <p>2- Monthly exams</p> <p>2- Final exams</p>
<p>C- Emotional and evolutional goals</p> <p>1. The ability to isolation and identification of bacteria from different sources.</p> <p>2. Linking knowledge with the environmental and clinical isolates.</p>

Learning Methods
<ol style="list-style-type: none">1. Explanation and Discussion of the Lectures2. Boosting the student to conduct research and reports.3. Doing a short exam during the lecture.
<p>d- General qualification skills transferred (other skills related to employability and personality development)</p> <ol style="list-style-type: none">1. Developing the mental abilities of the student2. Developing the skills3. Dealing with field and laboratory4. 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.			
9th 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
11th 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
13th 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
14th 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:
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<p>2 References</p>	<p>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.</p>
<p>Recommended readings</p>	<p>Prepared lectures by the course leader depending on the above refernces</p>
<p>Electronic website</p>	<p>American Society for Microbiology (ASM) http://www.asmta.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 /</p>

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 2022-2021

Number of study hours (total) - 6

Two hours a week

Date this description was prepared -7

9/15/2021

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 pistil, anther, 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	2021-2022
6. Total of study hours	30 practical hours
7. The course description was	1-9-2021
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://wikibooks .

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.

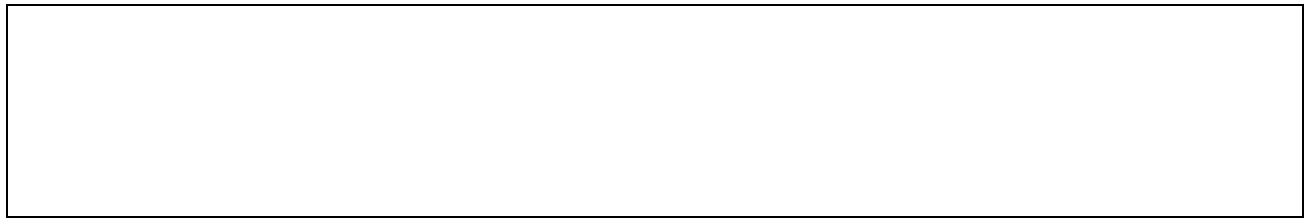
1.Educational Institution

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	2021-2022
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	
<p>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.</p>	

11. Course outcomes and methods of teaching, learning and assessment
<p>a- Knowledge and Understanding goals</p> <p>a.1. Recognize the types of basic tissues in the human body .</p> <p>a.2. Recognize the structure of basic tissue in the different system .</p> <p>a.3. To develop the ability of the students to identify the normal identification of body tissues.</p> <p>a.4. To Identify the main functions and their relation to resources.</p> <p>a.5. Identify the pathogens associated with tissues abnormalities.</p> <p>a.6. To understand the ultrastructure , chemical and physiological properties of variable tissues.</p> <p>.</p>

<p>b- Subjective- Specific Skills for the course</p> <p>b.1. Recognize the classification of tissues in our body by laboratory examination.</p> <p>b.2. Summarized the suitable technique to examining types of tissues.</p> <p>b.3. Determined the most suitable methods to study the tissues.</p>
<p>c- Teaching and Learning Methods</p>
<p>1. Explanation and Discussion of the theory and practical Lectures.</p> <p>2. It is boosting the student to conduct researches and reports.</p> <p>3. Urging the students to make PowerPoint presentations.</p>
<p>d- Evaluating Methods</p>
<p>1- Daily test and reports</p> <p>2- Monthly exams</p> <p>2- Semester and Final exams</p>
<p>e - Emotional and values goals</p> <p>1. The ability to recognize the importance of histology science in our life and health.</p> <p>2. Linking knowledge to understand the pathogenesis of diseases.</p>
<p>Learning Methods</p>
<p>1. Explanation and Discussion of the Lectures</p> <p>2. Boosting the student to conduct research and reports.</p> <p>3. The student PowerPoint presentations.</p>
<p>d- General qualification skills transferred (other skills related to employability and personality development)</p> <p>1. Developing the mental abilities of the student by new ideas to diagnosed and examination.</p> <p>2. Developing the skills</p> <p>3. Dealing with hospitals and laboratory work.</p> <p>4. Practical study to prepared some slides and examined by students.</p>



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			
13th 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
14th 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

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

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	2021-2022
6. Total of study hours	Two hours of theory +Two practical hour
7. The course description was	1-9-2021
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**

<p>Teaching and learning methods</p> <p>Theoretical and practical lectures</p> <p>Use of presentations and scientific films</p> <p>Practical experiments</p>
<p>Evaluation methods</p> <p>Theoretical, semester and final exams</p>
<p>C- Emotional and value goals</p> <p>1. The ability to isolates of different microorganisms and their importance in earth ecosystem.</p> <p>2. Linking the role of microorganisms to Phenomena related to the environments.</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development)</p> <p>1.evaluation the role of microorganisms in different environments for environmental problem solving</p> <p>2. Developing the skills of students</p> <p>3. Dealing with field and laboratory experiments</p>

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	<p>practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>		lesson	2h. lab.	
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Microbial ecology	Student understanding of the lesson	2 h. lect. 2h. lab.	3
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	<p>Presence of microorganisms in different environment</p> <p>Soil environment</p>	Student understanding of the lesson	2 h. lect. 2h. lab.	4
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Water environment	Student understanding of the lesson	2 h. lect. 2h. lab.	5
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Air environment	Student understanding of the lesson	2 h. lect. 2h. lab.	6
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Extreme environment	Student understanding of the lesson	2 h. lect. 2h. lab.	7
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p>	<p>Biogeochemical cycle</p> <p>Carbon cycle</p>	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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11- Infrastructure	
books: 1- environmental Microbiology 2- microorganisms of soil	Required course books: * * * * *
<ul style="list-style-type: none"> • 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

B212 – Entomology- 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	Entomology- B212
4. Attendance Form Available	Weekly
5. Semester/ Year	2021-2022

6. Total of study hours	three hours of theory +one practical hour
7. The course description was	18-9-2021
<p>8. Aims of the Course</p> <ul style="list-style-type: none"> • Let the student know the insects and the difference between them and other class of Arthropoda • To study the morphology and to know the important external characterize • Study the physiology of the internal systems of the insect • Study the taxonomy of the different orders and how can we differences between each other • Let students know the different methods for control the insects 	
9.Course outcomes and methods of teaching, learning and assessment	
<p>a- Knowledge and Understanding goals</p> <p>studying the morphological, physiological and taxonomical of different insects</p>	
<p>b- Skill objectives for the course</p> <p>is to know how to identify the insects then how to control it by knowing it to used the useful insecticide.</p>	
<p>Teaching and learning methods</p> <p>Theoretical lectures and practical workshop.</p> <p>Also using other education tools such as power point, films and other</p>	

<p>Evaluation methods</p> <p>Theoretical exam, at least 2 / semester.</p> <p>Practical exam. At least 1/ semester.</p> <p>A quiz exam. Whenever the time is suitable</p>
<p>C- Emotional and value goals</p> <p>To increase communication between the students through practical lesson as well as the scientific journey in collection insects, that reflect in the improving the psychological case of the students.</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development)</p> <p>Developing the mental abilities of the student</p> <p>Knowing the health reality</p>

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	Body parts, the head	Student understanding of the lesson	3h. lect. 2h. lab.	1
boDaily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Body parts, the thorax	Student understanding of the lesson	3h. lect. 2h. lab.	2
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films	Body parts, the abdomen	Student understanding of the lesson	3h. lect. 2h. lab.	3

	Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Integument, Digestive system	Student understanding of the lesson	3h. lect. 2h. lab.	4
	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Examination			5
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Excretory system	Student understanding of the lesson	3h. lect. 2h. lab.	6
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Respiratory system	Student understanding of the lesson	3h. lect. 2h. lab.	7
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Reproductive system	Student understanding of the lesson	3h. lect. 2h. lab.	8
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Nervous system	Student understanding of the lesson	3h. lect. 2h. lab.	9
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films	Circulatory system	Student understanding of the lesson	3h. lect. 2h. lab.	10

	scientific films Practical application				
	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Examination	Student understanding of the lesson		11
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Primitive orders, Ephemeroptera, Odonata and orthoptera	Student understanding of the lesson	3h. lect. 2h. lab.	12
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Hemipterous orders	Student understanding of the lesson	3h. lect. 2h. lab.	13
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Coleoptera and Diptera orders	Student understanding of the lesson	3h. lect. 2h. lab.	14
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Lepidoptera and hymenoptera	Student understanding of the lesson	3h. lect. 2h. lab.	15
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11- Infrastructure	
general insects science, (in Arabic)	Required course books: * * * * *
imm's text book of entomology, by Davis, Ronland	Main references (sources)- - -
Distractive and usfull insects , borrar and Borrer	Books and references that he recommends (scientific journals, reports.....)- - -

Many websites deals with the insects science	Electronic references, websites- - -
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12- Curriculum development plan

Implicit addition of new information within the main course contexts

Add new registered fungi

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	2021-2022
7. Total of study hours	30 hours + 30 practical hours
8. The course description was	prepared in 01/09/2021
9. Aims of the Course	
<p>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.</p>	

12.Course outcomes and methods of teaching, learning and assessment
<p>a- Knowledge and Understanding goals</p> <p>a.1. Introducing the student to MATLAB.</p> <p>a.2. Dealing with mathematical variables and equations in Matlab .</p> <p>a.3.Dealing with arrays, vectors, and mathematical operations provided by Matlab .</p> <p>a.4.Programming for condition sentences, loop sentences and coder language MATLAB.</p> <p>a.5. Matlab graphics.</p>
<p>b- Subjective- Specific Skills</p> <p>b.1. A1- Solve equations in MATLAB language.</p> <p>b.2. Knowing some of the applications and functions of the Matlab language.</p>
Learning Methods
<p>1. question and answer</p> <p>2. Explanation of the lectures</p> <p>3.discussion</p>
Evaluating Methods
<p>1- weekly test</p> <p>2- Monthly exams</p> <p>3-oral questions - Student participation</p> <p>4- Final exams</p>
<p>C- Emotional and evolutional goals</p> <p>c.1. Understand the importance of MATLAB language.</p> <p>c.2. Mathematical operations with deal easily.</p> <p>c.3. Understand the data through the Matlab graphics.</p>
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, 2 ^{ed} 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
3 ^{ed} ,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 8 th 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.	
9th, 10th 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 comparison operations provided by Matlab Understanding the conditional sentence if and switch conditional sentence	Daily and monthly tests
12th week	2 h. lect. 2h. lab.	Theoretical: second semester exam practical: practical second semester exam			
13th 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
15th 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	
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1- Textbooks required for the course	
2 References	<p>MATLAB Help Version 6.5 .1</p> <p>MATLAB 6.5 الدليل المرجعي والتعليمي، المهندس عبد الكريم البيكو، (دار شعاع للنشر). .2</p> <p>3. Matlab: A Practical Introduction to Programming and Problem Solving Butterworth-Heinemann is an imprint of Elsevier 2009</p>
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	2021-2022
6. Total of study hours	30 hours + 60 practical hours
7. The course description was	prepared in 17/09/2021
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. 10. The structure of the course

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

Learning method	Learning method	Learning method	Learning method	Learning method	Learning method
Course or topic	Course or topic	Course or topic	Course or topic	Course or topic	Course or topic
learning outcomes	learning outcomes	learning outcomes	learning outcomes	learning outcomes	learning outcomes
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 lectures	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 lectures	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 lectures	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 replication from Procaryote	lectures		

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 understanding of lectures		
		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 of lectures	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 of lectures	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 of lectures	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 of lectures	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 of lectures	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 of lectures	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 of lectures	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 of lectures	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 of lectures	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 of lectures	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 of lectures	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. Benjamin Cummings, 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	<p>1- وفاء جاسم الرجب و حسن محمد علي القزاز . علم الاحياء المجهرية ،الجزء الاول، ترجمة ، جامعة الموصل (كتاب منهجي).</p> <p>2- غالب حمزة البكري. مبادئ الهندسة الوراثية. جامعة البصرة(كتاب منهجي).</p>

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	2021-2022
6. Total of study hours	Two hours of theory +one practical hour
7. The course description was	1-9-2021
<p data-bbox="256 751 467 779">8. Aims of the Course</p> <p data-bbox="256 888 786 915">Introduce the student to the meaning of Medical plants</p> <p data-bbox="256 953 881 980">Preparing a staff capable of diagnosing mycolog Medical plants y</p> <p data-bbox="256 1018 927 1045">Preparing a staff capable of conducting research on the Medical plants</p> <p data-bbox="256 1083 850 1110">Preparing a staff capable of carrying out general examinations</p>	
9.Course outcomes and methods of teaching, learning and assessment	
<p data-bbox="256 1497 638 1524">a- Knowledge and Understanding goals</p> <p data-bbox="256 1562 839 1589">Recognize the types of active compounds in medicinal plants</p>	
<p data-bbox="256 1629 561 1656">b- Skill objectives for the course</p> <p data-bbox="256 1694 1044 1722">Knowledge of medicinal plants and howto extract effective compounds from them</p>	

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

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 Practical application	Taxonomic of alkaloids	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	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 principles	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	Examples of some plant families rich in medicinal substances	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	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	2021-2022
6. Total of study hours	Two hours of theory +Two practical hour
7. The course description was	2021-2022
<p>8. Aims of the Course</p> <ul style="list-style-type: none"> • 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	
<p>a- Knowledge and Understanding goals</p> <ul style="list-style-type: none"> • 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
<p>Teaching and learning methods</p> <p>Theoretical and practical lectures</p> <p>Using of educational aids, presentations and scientific films</p> <p>Practical application</p>
<p>Evaluation methods</p> <p>Theoretical, semester and final exams</p>
<p>C- Emotional and value goals</p> <p>The ability to communicate information after collecting and promising data</p> <p>Linking information to human health</p> <p>Preserve the wealth</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development)</p> <p>Developing the mental abilities of the student</p> <p>Knowing the health reality</p> <p>Dealing with machines and kits specific for different immunological tests</p>

10- The structure of the course					
Evaluation method	learning method	Unit name / course or topic	Required learning outcomes	Hours	Week
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	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 scientific films Practical application	Components of innate immunity	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	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, presentations and scientific films Practical application	Complements components	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	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 antibody 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	-
	-

	<p>Books and references that he recommends (scientific journals, reports.....)-</p> <p>-</p> <p>-</p>
	<p>Electronic references, websites-</p> <p>-</p> <p>-</p>

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	2021-2022
6. Total of study hours	2 hours + 2 practical hours
7. The course description was	1-9-2021
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	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> 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.	
<ul style="list-style-type: none"> 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 understanding	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	
	<p>Required course books:</p> <p>* * * * *</p>

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

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	2021-2022
6. Total of study hours	2 hours + 2 practical hours
7. The course description was	1-9-2021
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

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

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

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

	<p style="text-align: center;">s and scientific films Practical application</p>				
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11- Infrastructure	
Aquatic plants	<p style="text-align: right;">Required course books:</p> <p>* * * * *</p>
<p>1-Fundamentals of Aquatic Ecology, 2nd Edition, R. S. K. Barnes , K. H. Mann 2-R, Mishra S., and Saksena D. N. 1949-, eds. <i>Aquatic ecology</i>. Delhi: 3-lectures power points-</p>	<p style="text-align: right;">Main references (sources):</p>
	<p>Books and references that he recommends (scientific journals, reports.....)</p> <p>- - -</p>
<p>http://wikibooks. www.Jairr.com www.damastagate.com</p>	<p>Electronic references, websites</p>

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	2021-2022
6. Total of study hours	30 hours + 60 practical hours
7. The course description was	1-9-2021
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 blood cells in human .	
b- Subjective- Specific Skills	
b.1.To do different laboratory analysis in human an blood .	

<p>b.2. Measurement of cholesterol . b.3. To diagnosis all types of anemia .</p>
Learning Methods
<p>1. Explanation and Discussion of the Lectures 2. boosting the student to make reports, and power point presentation .</p>
Evaluating Methods
<p>1- Daily test and reports 2- Monthly exams and final exam .</p>
<p>C- Emotional and evolutional goals</p> <p>Training the student to use different apparatus in the laboratory and develop research capacities to the students.</p>
<p>d- General qualification skills transferred (other skills related to employability and personality development)</p> <p>1. Developing the skills mental abilities of the student 2. Dealing with laboratory work.</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development)</p> <p>Developing the mental abilities of the student Knowing the health reality</p>

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://wikibooks . www.lairr.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	2021-2022
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	
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
<p>a- Knowledge and Understanding goals</p> <p>a.1. The student can compare the different types of genetic traits.</p> <p>a.2. To know the different structures of genetic material</p> <p>a.3. The student can know how to deal with the practical aspects of genetic material</p>
<p>b- Subjective- Specific Skills</p> <p>b.1. Compare the different types of genetic traits</p> <p>b.2. Discuss how genetic traits appear on living organisms</p>
Learning Methods

<ol style="list-style-type: none"> 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
<ol style="list-style-type: none"> 1- Daily test and reports 2- Monthly exams 2- Final exams
<p>C- Emotional and evolutional goals</p> <ol style="list-style-type: none"> 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
<ol style="list-style-type: none"> 1. Explanation and Discussion of the Lectures 2. Boosting the student to conduct research and reports. 3. The student PowerPoint presentations.
<p>d- General qualification skills transferred (other skills related to employability and personality development)</p> <ol style="list-style-type: none"> 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, 2 ^{ed} , 3 ^{ed} weeks	2 h. lect. 2h. lab.	Chromosome structure 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 6 th 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 8 th 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 10 th 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			
12 th weeks and 13 th	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 15 th 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	
16 th	2 h. lect. 2h lab	Second semester	Knowledge and	Understand the evolving state	Daily and monthly
week	11. Infrastructure of lectures			learn to carry	tests
1- Textbooks required for the course				field and in the	
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	2021-2022
6. Total of study hours	Two hours of theory +one practical hour
7. The course description was	1-9-2021
<p>8. Aims of the Course</p> <p>Introduce the student to the meaning of parasitology</p> <p>Preparing a staff capable of diagnosing parasites</p> <p>Preparing a staff capable of conducting research on the types of parasites</p> <p>Preparing a staff capable of carrying out general medical examinations</p>	
9. Course outcomes and methods of teaching, learning and assessment	
<p>a- Knowledge and Understanding goals</p> <p>Recognize the types of parasites</p> <p>Medical importance and risks</p> <p>controlling it</p>	

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

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 scientific films	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: <ul style="list-style-type: none"> • Foundation of parasitology animal vector • Human parasitology 	Required course books: * * * * *
<ul style="list-style-type: none"> • Diagnostic medical parasitology 	Main references (sources)-

<ul style="list-style-type: none"> • Essentials of medical parasitology • Basic laboratory methods in clinical parasitology 	<p>-</p> <p>-</p>
	<p>Books and references that he recommends (scientific journals, reports.....)-</p> <p>-</p> <p>-</p>
	<p>Electronic references, websites-</p> <p>-</p> <p>-</p>

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

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
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2. Department	Biology
3- Name/code of the course	Mycology -B311
4. Attendance Form Available	Weekly
5. Semester/ Year	2021-2022
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	
<p>Introduce the student to the meaning of mycology</p> <p>Preparing a staff capable of diagnosing mycology</p> <p>Preparing a staff capable of conducting research on the types of mycology</p> <p>Preparing a staff capable of carrying out general examinations</p>	
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 Use of educational aids, presentations and scientific films Practical application	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: * * * * *

<p style="text-align: center;">Diagnostic medical mycology •</p> <p style="text-align: center;">Clinical mycology</p>	<p style="text-align: center;">Main references (sources)-</p> <p style="text-align: right;">-</p> <p style="text-align: right;">-</p>
	<p style="text-align: center;">Books and references that he recommends (scientific journals, reports.....)-</p> <p style="text-align: right;">-</p> <p style="text-align: right;">-</p>
	<p style="text-align: center;">Electronic references, websites-</p> <p style="text-align: right;">-</p> <p style="text-align: right;">-</p>

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

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	2021-2022
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	
Develop the student's ability to recognize the importance of development of Embryology , identifying the composition of organs and recognize and eliminate foetal abnormalities 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 evolutionary 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 in Bird 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	2021-2022
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	
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	
11th 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
13th 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
14th 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:	
<ul style="list-style-type: none"> - 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:	
<ul style="list-style-type: none"> - 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	
<ul style="list-style-type: none"> - DNA extraction in different ways. - Using Molecular Biology Techniques in the Laboratory 	

Teaching and learning methods: <ul style="list-style-type: none"> - Live explanation and use of Power Point slides. - Use pictures and templates. - Laboratory equipment.
Evaluation methods: <ul style="list-style-type: none"> - Daily exams (Quiz) - Reports - Monthly exams
Emotional and value goals: <ul style="list-style-type: none"> - 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): <ul style="list-style-type: none"> - 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
					16
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					30

11- Infrastructure	
Books:	Required course books:
Principles of Molecular Genetics	*
	*
	*
	*
	*

	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
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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	2021-2022
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	
<p>Course Objectives: The practical algae course aims to:</p> <ul style="list-style-type: none"> - 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
<p>a- Knowledge and Understanding goals</p> <p>a.1. Recognize the types of algae in the world .</p> <p>a.2. Recognize of the reproduction and life cycle in the grope of algae.</p> <p>a.3. To develop the ability of the students to use some of the available devices such as microscopy</p> <p>a.4. Taking students to some sites to learn about the environment of algae and compare it with other environments</p> <p>a.5 Assigning students to bring water or mud samples to the laboratory and diagnose the algal species there.</p> <p>a.6. Statement of the importance of algae, including water purification</p> <p>.</p>

<p>b- Skill objectives for the course</p> <p>b.1. Recognize of the grope of algae in different environment.</p> <p>b.2 Acquire the skill of handling algae samples and make temporary slides to examine algae microscopically</p> <p>b.3. Develop the student's ability to deal with algal specimens</p>
<p>Teaching and learning methods</p>
<p>1. Explanation and Discussion of the Lectures</p> <p>2. Make short tests during the lesson.</p> <p>3. Urging the student to make PowerPoint presentations.</p>
<p>Evaluating Methods</p>
<p>-Theoretical, semester</p> <p>- Monthly exams</p> <p>- Final exams</p>
<p>C- Emotional and value goals</p> <p>1. The ability to recognize the importance of algae in different environment.</p> <p>2. Linking knowledge to environmental reality.</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development)</p> <p>Developing the mental abilities of the student</p> <p>Knowing the health reality</p>

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

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 Kingdom 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	2021-2022
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
<p>a- Knowledge and Understanding goals</p> <p>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.</p> <p>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</p>
<p>b- Subjective- Specific Skills</p> <p>b.1. . give student advance skill to distinguish among animals anatomically.</p> <p>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</p>
Learning Methods
<p>1. Explanation and Discussion of the Lectures</p> <p>2. It is boosting the student to conduct research and reports.</p> <p>3. Urging the student to make PowerPoint presentations.</p>
Evaluating Methods
<p>1- Daily test and reports</p> <p>2- Monthly exams</p> <p>2- Final exams</p>
<p>C- Emotional and evolutional goals</p> <p>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</p> <p>2. Linking knowledge to reality.</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development)</p> <p style="text-align: right;">Developing the mental abilities of the student</p>

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	
11th 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
13th 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
14th 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 [1] anatomy,part1,Dr.Aruold lang,2020,584p,alpha edition.		

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

12. Course Development Plan

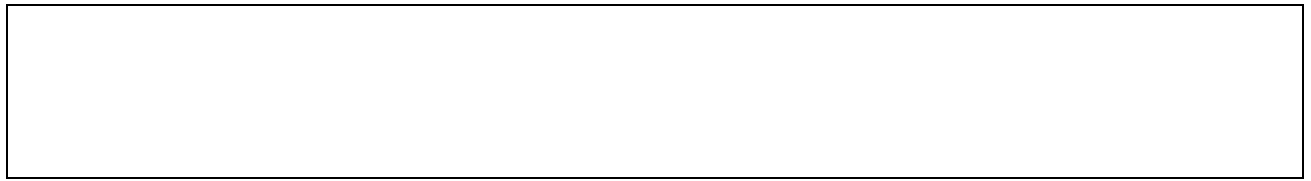
Course development based on recent versions of books and references..
The adoption of modern interactive teaching methods.
Activating alignment programs with international universities to learn about modern curricula and to exchange the experiences.

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
17. Course outcomes and methods of teaching, learning and assessment	
2. Department	Biology
Knowledge and Understanding goals	
<ul style="list-style-type: none"> • Study of microbial growth 	
4.1	<ul style="list-style-type: none"> • Know the types of microbial medium • Know the biosynthesis
5.1	<ul style="list-style-type: none"> • Study of photosynthesis • Study of fermentation and anaerobic respiration
6. Semester / Year	2021-2022
Learning Methods	
<ol style="list-style-type: none"> 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	
<ol style="list-style-type: none"> 1- Daily test and reports 2- Monthly exams 	
De 2- Final exams	
Emotional and evolutionary 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
1st week, 2^{ed}, 3^{ed} 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
4th week, 5th 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
7th week, and 8th weeks	2 h. lect. 6h. lab.	Phyotosynthesis	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
9th 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
11th 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
13th 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 15 th 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	Daily and monthly tests
11. Infrastructure					
1- Textbooks required for the course			work. in the laboratory		
2 References			كتاب : مبادئ فسلجة الاحياء المجهرية للدكتورة مها رؤوف السعد		

12. Course Development Plan
<p>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.</p>

Enzymes B 487 forth Stage

Course Description Form

<p>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.</p>
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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	2021-2022
6. Total of study hours	30 hours + 60 practical hours
7. The course description was	1-9-2021
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 <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> b.1.To do different laboratory analysis in enzymes . b.2. Measurement of liver enzymes . b.3. To identify different enzymes actions . 	
Learning Methods	
<ol style="list-style-type: none"> 1. Explanation and Discussion of the Lectures 2. boosting the student to make reports, and power point presentation . 	
Evaluating Methods	

<p>1- Daily test and reports 2- Monthly exams and final exam .</p>
<p>C- Emotional and evolutional goals</p> <p>Training the student to use different apparatus in the laboratory and develop research capacities to the students.</p>
<p>d- General qualification skills transferred (other skills related to employability and personality development)</p> <p>1. Developing the skills mental abilities of the student 2. Dealing with laboratory work.</p>

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			
				17
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Recommended readings	<u>Enzyme Therapy: Current Challenges and Future Perspectives</u>
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 METHODS IN PLANT REPRODUCTIVE , SPECIALLY THE RARE AND DIFFICULT PLANT , WITHOUT NEED FARMS OR SOIL , JUST INSIDE THE LABORATORY

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	2021-2022
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 a piece of explants , sterilization , culturing , incubation , finally get a whole plant can alife out side the lab. to garden or farm	

18. Course outcomes and methods of teaching, learning and assessment
<p>a- Knowledge and Understanding goals</p> <p>1- Define plant tissue culture to rare plants.</p> <p>2- Explain the stages of micropropagation.</p> <p>3- Explain preparation of culture media inside lab.</p> <p>4- Understand the important methods for sterilization in tissue culture lab.</p> <p>5- Define the methods for plant tissue culture.</p>
<p>b- Subjective- Specific Skills</p> <p>1- Identify and understand the plant tissue culture and design the lab.</p> <p>2- Development the ability of students to culturing the plant inside lab .</p>
Learning Methods
<p>1. Explanation and Discussion of the Lectures</p> <p>2- Research and reports from the students .</p>
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: Organogenesis 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

		Garlic tissue culture		laboratory	
13th week,	2 h. lect. 2h. lab.	Microprolagation 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
14th 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
<p>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.</p>

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	2021-2022
6. Total of study hours	Two hours of theory +two practical hour
7. The course description was	1-9-2021
8. Aims of the Course	
<ul style="list-style-type: none">• 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	Immuno electrophoresis 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 +Nephelometry 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
					18
					19
					20
					21
					22
					23
					24
					25
					26
					27
					28
					29
					30

11- Infrastructure	
Books	Required course books: *
<ul style="list-style-type: none"> immunology and serology 	*
	*

	*
	*
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	2021-2022
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	
<p>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</p>	

19.Course outcomes and methods of teaching, learning and assessment
<p>a- Knowledge and Understanding goals</p> <p>a.1. Recognize the types fungal infections to human and animals.</p> <p>a.2. Determination factors that increased the rate of fungal infections</p> <p>a.3. Study the pathogenicity of pathogenic fungi</p> <p>a.4. Determination the suitable treatment for each type of fungal infections</p> <p>a.5. study the prevalence of fungal infections</p> <p>a.6. To understand the mechanism of antifungals and specific targets effected in fungal cell</p> <p>.</p>
<p>b- Subjective- Specific Skills</p> <p>b.1. Determination the methods of isolation and identification of pathogenic fungi</p> <p>b.2. Evaluation the ability of diagnosis for fungal infections</p> <p>b.3. Identify and understanding the prevention of fungal infections</p>
Learning Methods
<p>1. Explanation and Discussion of the Lectures</p> <p>2. It is boosting the student to conduct research and reports.</p> <p>3. Urging the student to make PowerPoint presentations.</p>
Evaluating Methods
<p>1- Daily test and reports</p> <p>2- Monthly exams</p> <p>2- Final exams</p>
<p>C- Emotional and evolutional goals</p> <p>1. The ability to recognize the importance of water resource in earth system.</p> <p>2. Linking knowledge to environmental reality.</p>
Learning Methods
<p>1. Explanation and Discussion of the Lectures</p> <p>2. Boosting the student to conduct research and reports.</p> <p>3. The student PowerPoint presentations.</p>

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			
13th 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
14th 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, Cramer 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 2021-2022

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	2021-2022
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.

<p>Evaluation methods:</p> <ul style="list-style-type: none"> - Daily exams (Quiz) - Reports - Monthly exams
<p>Emotional and value goals:</p> <ul style="list-style-type: none"> - The ability to deliver information - Learn about recent developments in the field of nanotechnology - The ability to explain things using the science of nanotechnology
<p>Transferred general and qualification skills (other skills related to employability and personal development):</p> <ul style="list-style-type: none"> - 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 nanotechnology			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: <ul style="list-style-type: none"> <li style="text-align: right;">* <li style="text-align: right;">* <li style="text-align: right;">* <li style="text-align: right;">* <li style="text-align: right;">*
	Main references (sources): 1- Murty & Murday

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

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
20. Course outcomes and methods of teaching, learning and assessment	
2. Department	Biology
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.	
8. Th	
b- Subjective- Specific Skills	
9. Ai b.1. Recognize the sources of cell lines .	
b.2. Acquiring the skills of calculating the cytotoxicity and analyzing its results	
Dev b.3. Identity and understanding of Maintaining cell culture methods and how to and i achieve them.	
main	
Learning Methods	
in which animal cell culture is used and the factors affecting on it.	
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 evolutionary 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

11th 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
13th 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
14th 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 Edition by Freshney, R.L. WILEY-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	2021-2022
6. Total of study hours	Two hours of theory +Two practical hour
7. The course description was	2021-2022

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

<p>C- Emotional and value goals</p> <ul style="list-style-type: none"> • The ability to communicate information after collecting and promising data • Linking information to how to grow a plant and adapt to their environments
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development)</p> <p>Developing the mental abilities of the student</p> <p>Dealing with equipment used in laboratories of plant physiology</p>

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, presentations and scientific films Practical application	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
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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 - 2022
6- Number of hours of study (total)	30 Hour
7- The date of description	
8- Course objectives:	
<ul style="list-style-type: none"> 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:	
<ul style="list-style-type: none"> - 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	
<ul style="list-style-type: none"> - DNA extraction in different ways - The use of various devices for the specialization of biotechnology 	
Teaching and learning methods:	
<ul style="list-style-type: none"> - Live explanation and use of Power Point slides. - Use pictures and templates. - Laboratory equipment. 	

Evaluation methods: <ul style="list-style-type: none"> - Daily exams (Quiz) - Reports - Monthly exams
Emotional and value goals: <ul style="list-style-type: none"> - 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): <ul style="list-style-type: none"> - 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 2021-2022

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	2021-2022
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	Week
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:
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Essential of Hematologys	* * * * *
	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	2021-2022
6. Total of study hours	Two hours of theory +one practical hour
7. The course description was	1-9-2021
<p>8. Aims of the Course</p> <ol style="list-style-type: none"> 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. 	
<p>9.Course outcomes and methods of teaching, learning and assessment</p>	
<p>a- Knowledge and Understanding goals</p> <p>Assist students in diagnosing viral diseases</p>	
<p>b- Skill objectives for the course</p> <p>Acquisition of virological diagnosis skills</p> <p>Control of its transmission routes</p>	

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

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- 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: *

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

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

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 15/08/2021
9. Aims of the Course	
<ul style="list-style-type: none"> ● 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.

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

<ul style="list-style-type: none"> 1- Daily test and reports 2- Monthly exams 2- Final exams
<p>C- Emotional and evolutional goals</p> <ul style="list-style-type: none"> 1. The ability to recognize the importance of water resource in earth system. 2. Linking knowledge to environmental reality.
<p>Learning Methods</p>
<ul style="list-style-type: none"> 1. Explanation and Discussion of the Lectures 2. Boosting the student to conduct research and reports. 3. The student PowerPoint presentations.
<p>d- General qualification skills transferred (other skills related to employability and personality development)</p> <ul style="list-style-type: none"> 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.	<p>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</p> <p>Practical: Studying fungal growth and fungal growth rate with determination of methods that used to measure growth rate</p>	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.	<p>Theoretical: Definition of growth and growth rate with main hypothesis that explain the mechanism of apical growth in filamentous fungi</p> <p>practical: study the fungal growth curve and laboratory experiments to determine fungal growth rate according to colony diameter and dry weight</p>	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.	<p>Theoretical: Study the environmental factors affected on fungal growth</p> <p>Practical: Effect of environmental factors on fungal growth (temperature, pH, nutrition, salinity)</p>	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

9th 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
11th 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
13th 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
14th week, and 15th weeks	2 h. lect. 2h. lab.	Theoretical: Mycotoxins ,antifungals and their mode of action. Practical :	Knowledge and understanding of lectures	Understand the evolving state of knowledge learn to carry out practical work, in the	Daily and monthly tests
11. Infrastructure					
		that inhibited fungal growth		laboratory	
1- Textbooks required for the course					
2 References			<ul style="list-style-type: none"> Deacon J. Fungal biology. 4th ed. MA, USA: Blackwell Publishing; 2006. Di Iaconi C, Ramadori R, Lopez A, Passino R. Influence of 		

	<p>hydrodynamic shear forces on properties of granular biomass in a sequencing batch biofilter reactor. Biochem Eng J 2006;30:152–7.</p> <ul style="list-style-type: none"> • 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
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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 01/09/2021
9. Aims of the Course	
<p>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</p>	

21. Course outcomes and methods of teaching, learning and assessment
<p>a- Knowledge and Understanding goals</p> <p>a.1. Recognize the types fungal infections to human and animals.</p> <p>a.2. Determination factors that increased the rate of fungal infections</p> <p>a.3. Study the pathogenicity of pathogenic fungi</p> <p>a.4. Determination the suitable treatment for each type of fungal infections</p> <p>a.5. study the prevalence of fungal infections</p> <p>a.6. To understand the mechanism of antifungals and specific targets effected in fungal cell</p> <p>.</p>

<p>b- Subjective- Specific Skills</p> <p>b.1. Determination the methods of isolation and identification of pathogenic fungi</p> <p>b.2. Evaluation the ability of diagnosis for fungal infections</p> <p>b.3. Identify and understanding the prevention of fungal infections</p>
<p>Learning Methods</p>
<p>1. Explanation and Discussion of the Lectures</p> <p>2. It is boosting the student to conduct research and reports.</p> <p>3. Urging the student to make PowerPoint presentations.</p>
<p>Evaluating Methods</p>
<p>1- Daily test and reports</p> <p>2- Monthly exams</p> <p>2- Final exams</p>
<p>C- Emotional and evolutional goals</p> <p>1. The ability to recognize the importance of water resource in earth system.</p> <p>2. Linking knowledge to environmental reality.</p>
<p>Learning Methods</p>
<p>1. Explanation and Discussion of the Lectures</p> <p>2. Boosting the student to conduct research and reports.</p> <p>3. The student PowerPoint presentations.</p>
<p>d- General qualification skills transferred (other skills related to employability and personality development)</p> <p>1. Developing the mental abilities of the student</p> <p>2. Developing the skills</p> <p>3. Dealing with field and laboratory</p> <p>4. Monitoring and evaluating water resources in the environment and the impact of climate change.</p>

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	2021-2022
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 scientific films	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			
13th 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
14th 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, Cramer 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.

B443 – Applied Microbiology - fourth Stage

Course Description Form

The Course Is Characterized By Dealing With Important Applied Vocabulary In Various Industrial, Environmental And Health Fields To Consolidate The Concepts Of Problems That Occur In Industry And The Environment And Ways To Treat Them Biologically With Modern And Environmentally Friendly Techniques Based On The Capabilities Of Diverse And Effective Microorganisms, Which Contributes To Building Experienced Students

1. Educational Institution	College of Science/ University of Basrah
2. Department	Biology
3- Name/code of the course	Applied Microbiology - B443
4. Attendance Form Available	Weekly
5. Semester/ Year	2021-2022
6. Total of study hours	Two hours of theory + two practical hour
7. The course description was	1-9-2021
8. Aims of the Course -Raising the scientific and practical level of students -Develop practical study skills and link them to theoretical foundations - Providing the department with 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 -Apply theoretical skills in the field	
9. Course outcomes and methods of teaching, learning and assessment	
a- Knowledge and Understanding goals Characterized By Dealing With Important Applied Vocabulary In Various Industrial, Environmental And Health Fields To Consolidate The Concepts Of Problems That Occur In Industry And The Environment And Ways To Treat Them Biologically	
b- Skill objectives for the course	

<p>Acquisition of microorganisms skills Friendly Techniques Based On The Capabilities Of Diverse And Effective Microorganisms Contributes To Building Experienced Students</p>
<p>Teaching and learning methods Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application</p>
<p>Evaluation methods Theoretical, semester and final exams</p>
<p>C- Emotional and value goals The ability to communicate information after collecting and promising data Linking information to human health and environmental reality Preserve the wealth and environmental</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development) Developing the mental abilities and practical of the student Knowing the health reality and environmental</p>

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	Physical factors 1	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	Chemical factors	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	Biological factors	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	Applications of surfactants	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	First Examination	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	Microbial Corrosion Applications	Student understanding of the lesson	2 h. lect. 3h. lab.	6

	Practical application				
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Oil biodegradation applications	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	Microbiology Enhanced Oil recovery	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	Bacteriological examination of 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	Second Semester Exam	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	Applications of antimicrobial agents	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	Water treatment technique	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	Microbial Fuel Cells	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	final Semester Exam	Student understanding of the lesson	2 h. lect. 3h. lab.	15

11- Infrastructure	
1- Industrial Microbiology	book: * * * * *
2- Reviving the microscopic soil	book - - -
	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 information

B468– BIOLOGICAL CONTROL- 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. Education	
2. Department	Biology
3- Name/code of the course	BIOCONTROL B468
4. Attendance Form Available	Weekly
5. Semester/ Year	2021-2022
6. Total of study hours	Two hours of theory +one practical hour
7. The course description was	17-9-2021
8. Aims of the Course	<p>1- TO KNOW WHAT IS BIOCONTROL</p> <p>2- TO STUDY NATURAL ANIMIES</p> <p>3- HOW TO USE THE NATURAL ANIMIES</p> <p>4- AS WELL AS METHODS OF FIELD STUDIES AND ANALYSIS OF RESULTS</p>
9. Course outcomes and methods of teaching, learning and assessment	

<p>a- Knowledge and Understanding goals Recognize THE MEAN OF BIOCONEROL</p>
<p>b- TO KNOW THE UNDERSTANDING OF BIOCONTROL</p>
<p>Teaching and learning methods Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application</p>
<p>Evaluation methods Theoretical, semester and final exams</p>
<p>C- Emotional and value goals TO USE THE NATURAL ANEMIES YO CONTROL PESTS</p>
<p>D- Transferred general and rehabilitative skills (other skills related to employability and personal development) Developing the mental abilities of the student Knowing the USING BIOCONTROL FOR CONTROLLING PESTES</p>

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	1. Approaches to biological	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	2. Defnetions 3. The natural anemies.	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	4. The natural anemies.	Student understanding of the lesson	2 h. lect. 3h. lab.	3
Daily and monthly tests	Theoretical and practical lectures	5. Consevation of	Student understanding of the	2 h. lect.	4

monthly tests	Use of educational aids, presentations and scientific films Practical application	natural anemiesa premnent population	lesson	3h. lab.	
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	6. Biocontrol and pestecides	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	7. Clntrodection to natural anemeis and establishing	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	Using parasites and predators in biocontro	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	8. Using bactria	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	9. Using funji	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	10. Viruses	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	Genitic biocontrol	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	other methode in biocontrol	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	Herbs biocontrol	Student understanding of the lesson	2 h. lect. 3h. lab.	15

	scientific films Practical application				
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	
Introduction to biocontrol • •	Required course books: * * * * *
Biological control	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
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B454 – Genetic Engineering - 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	Genetic Engineering B454
4. Attendance Form Available	Weekly
5. Semester/ Year	2021-2022
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 a-The . Aims of the genetic engineering is not only to produce hybrid organisms with desirable characteristics, b- Its was an excellent way to identify many scientific secrets, especially those related to the structure and function of gene c- Introduce the student as experience in Genetic Engineering	

d-Introduce the student to the meaning of Genetic Engineering

Preparing a staff capable of deals with Genetic Engineering Techniques

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, presentations and scientific films Practical application	The Principles of Genetic Engineering	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	Genetic Material	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	Restriction and Modifying Enzyme	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	Restriction and Modifying Enzyme	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	Vectors for Gene Cloning	Student understanding of the lesson	2 h. lect. 3h. lab.	5
Daily and	Theoretical and	Vectors for Gene Cloning	Student understanding of the	2 h. lect.	6

monthly tests	<p>practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>		lesson	3h. lab.	
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Vectors for Gene Cloning	Student understanding of the lesson	2 h. lect. 3h. lab.	7
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Vectors for Gene Cloning	Student understanding of the lesson	2 h. lect. 3h. lab.	8
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Introduction of DNA into cells	Student understanding of the lesson	2 h. lect. 3h. lab.	9
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Introduction of DNA into cells	Student understanding of the lesson	2 h. lect. 3h. lab.	10
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Selection of Recombinant cells	Student understanding of the lesson	2 h. lect. 3h. lab.	11
Daily and monthly tests	<p>Theoretical and practical lectures</p> <p>Use of educational aids, presentations and scientific films</p> <p>Practical application</p>	Selection of Recombinant cells	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	Selection of Recombinant cells	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	Methods for clone identification	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	Methods for clone identification	Student understanding of the lesson	2 h. lect. 3h. lab.	16
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	Cloning strategy	Student understanding of the lesson	2 h. lect. 3h. lab	17
Daily and monthly tests	Theoretical and practical lectures Use of educational aids, presentations and scientific films Practical application	The Applications of Genetic Engineering	Student understanding of the lesson	2 h. lect. 3h. lab	18
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11- Infrastructure	
<p style="text-align: center;">molecular genetic • •</p> <p style="text-align: center;">Biochemistry •</p> <p style="text-align: center;">Cell biology. •</p>	<p>Required course books: *</p> <p style="text-align: right;">*</p> <p style="text-align: right;">*</p> <p style="text-align: right;">*</p> <p style="text-align: right;">*</p>
	Main references (sources)--
<p>1- Gene Cloning and DNA Analysis by BROWN, T. N</p> <p>2- Principal Of Gene Manipulation and Genomic by S.B. Primrose and R.M. Twyman (7th ed 2006)</p>	<p>Books and references that he recommends (scientific journals, reports.....)-</p> <p style="text-align: right;">-</p> <p style="text-align: right;">-</p>
	Electronic references, websites-

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12- Curriculum development plan

Implicit addition of new information within the main course contexts

Add new registered in Genetic Engineering