Biology

Program Catalogue 2025 – 2024

وصف البرنامج الدراسي – مسار بولونيا

Ministry of Higher Education and

Scientific Research - Iraq

University of Babylon

College of Science for women

First Cycle - Bachelor's Degree (B.Sc.)

Department of Biology

ASST. PROF. Dr.
Ekhlas M. A. Al Shareefi
The Head of Department

Biology

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❖ Mission & Vision Statement

In line with the University's mission, the academic vision of the School of the Biological Sciences is the pursuit of education, learning and research at the highest international levels of excellence. Our goal is to continue to deliver research and teaching at the highest levels, working in innovative ways to achieve ongoing excellence.

The research and teaching carried out in the School of the Biological Sciences is diverse and covers animal, human, plant and microbial science from the atomic, molecular and cellular levels through to tissues, organs, whole organisms, populations, ecosystems, biodiversity, and human behaviour. The research has impacts on health and disease across species, agriculture, conservation and the environment as well as on biotechnology.

- ### Our Mission

To serve the communities of our world, nation, country, and university by advancing understanding of living organisms and their interactions with the environment through research, to provide high-quality biology education with an emphasis on experiential learning and problem-solving, and to build public understanding of the living world through educational outreach activities for learners of all ages.

- ### Our Vision

The Department of Biological Sciences will be a leader in acquiring fundamental knowledge of the living world that will advance the health of the planet, including humans. We will fully integrate instruction and research so that all students not only learn but also, through their learning, actively contribute to our understanding of life.

- ### Our Strategic Goals

  - ✓ Advance our research efforts in emerging fields of the biological sciences and develop nationally recognized learning centers for undergraduate and graduate curricula
  - ✓ Increase the recruitment of and support for innovative and outstanding faculty who through research and teaching will develop the scientists, health professionals, government professionals, and mentors of the future
  - ✓ Foster an exciting environment where teaching, research, and service will stimulate our students to serve as leaders of the people of this country.

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- ✓ Enrich our regional environment with the development of scientific programs to include opportunities for participation of our local communities.

❖ Programme Specification

Programme Code :	**BIO**	**ECTS :**	**240**
Durations:	**4 levels & 8 Semesters**	**Method and attendance:**	**Full time**

The programmer is delivered in four stages, each of which comprises one year of full-time study during which the student must follow courses to the value of four-six units (one unit is roughly equivalent to 25 credits). The curriculum is based around a core of mandatory units running through all four stages providing a broad base of biology.

Level One comprises a selection of core, basic and support courses and seeks to provide a broadly based introduction to the subject. These courses consider major themes of Zoology concepts, Botany, and Analytic and Organic Chemistry, along with Biophysics, Biostatistics, Computer Science and Safety and biosecurity. **In Level Two**, students take more core, basic and support biological courses including Entomology, Plant Anatomy and Classification, Invertebrate and Parasitology, Biochemistry and Microbiology. These take the students beyond the basic courses in stage one and these courses enable students to specialize or maintain a broadly based programmer. These courses also provide a basis for research-led specialist options in stage three. **In Level Three**, students take another core biology courses including Cell Biology and Genetics, Ecology and Pollution, Animal histology and physiology, Immunology, Plant physiology, Microbial Physiology and Research Methodology. Most of these courses closely reflect the research interests of members of staff who are all specialists in their fields. **In Level Four**, students take another core biology course like Molecular Biology, Pathogenic Bacteriology, Mycology, Comparative Anatomy, Microbial Genetics, Virology, Industrial and Food Microbiology as well as they will choose 2 courses out of the organismal and molecular options available. Students also complete an individual research project, which provides training in a specialised research area and also in generic skills such as independent working, literature searching, report writing, use of word processing, graphics and statistics. Options are selected in consultation with the student's advisor.

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➢ Educational Aims of Programme

The BSc Honours Biological Sciences Programme is designed to give graduates in-depth knowledge related to the diversity and complexity of living organisms and their interactions. This course allows students to study life (bacterial, fungal, plant, animal) at the molecular level through to whole populations and ecosystems.

1- Demonstrate an extensive knowledge and understanding of concepts and theories relating to the biological sciences from the molecular and cellular aspects through to the whole-organism

2- Demonstrate a range of practical laboratory skills with respect to the investigation and manipulation of biological material and physical, chemical and biological measurements relevant to the biological sciences, and the application of these skills in a research project setting.

3- Demonstrate proficiency in the collation, quantitative analysis and interpretation of experimental data, and the ability to problem-solve.

4- Demonstrate an ability to communicate and apply knowledge on the biological sciences.

5- Demonstrate proficiency in the use of computers for data management and presentation.

The programme is underpinned by an active research environment and aims to enable all students to develop comprehensive subject-specific knowledge with practical and transferable skills in the core areas of Zoology, Genetics, Cell Biology, Biochemistry and Microbiology whilst encouraging creative thinking and innovation. On completion of the programme, successful students will have developed the knowledge and expertise required to pursue a research or other professional career in Biological Sciences.

➢ Learning Outcomes: Cognitive Skills

On the completion of this course successful students will be able to:

1- Analyze, synthesize and critically evaluate scientific literature.

2- Apply subject knowledge and understanding to generate hypotheses to address familiar and unfamiliar problems.

3- Demonstrate the ability to evaluate critically the appropriateness of different approaches to solving problems and appreciate the limitations of current hypotheses.

4- Recognize the importance of academic and research integrity and ethical issues of investigations.

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❖ Teaching/Learning Methods and Strategies

Outcomes are achieved through lectures, practical classes, discussions, field work, tutorials, group work, final year project work, online learning via the University VLE and independent study.

❖ Methods of Assessment

Students are assessed through class tests, unseen written examinations, practical reports, oral presentations, essays, posters, case studies, data analysis and a project thesis.

➢ Learning Outcomes: Knowledge & Understanding

On the completion of this course successful students will be able to:

1- Demonstrate a broad appreciation and understanding of the major theories and concepts in biological sciences.
2- Demonstrate a knowledge and understanding of the similarities and diversity of organisms and the processes which underpin life on earth.
3- Demonstrate a knowledge and understanding of biological sciences from the molecular to the whole organism, based on the recurring theme of evolution and natural selection.
4- Exhibit a critical awareness of the molecular basis of genetics and molecular biology.

❖ Teaching/Learning Methods and Strategies

Knowledge-based subject-specific learning and teaching is provided through lectures, module practical classes, discussions, fieldwork, tutorials, group work, final-year project work, and online learning via the University's independent study.

❖ Methods of Assessment

Students are assessed through unseen written examinations, class tests, practical reports, oral presentations, essays, posters, and project research.

➢ Learning Outcomes: Subject Specific

On the completion of this course successful students will be able to:

1- Comprehend the scientific literature relating to Biological Sciences and integrate information there from to address problems, and formulate and test hypotheses.
2- Be able to devise, evaluate and carry out experimental work in a biological sciences laboratory and/or field site.
3- Document and present data, using appropriate statistical analysis.

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4- Comply with health and safety regulations and ethics procedures relevant to the specific project type and/or practical environment.
5- Be proficient in the use of IT for accessing databases and scientific literature, manipulating, processing and presenting data and written assignments.

❖ Teaching/Learning Methods and Strategies

Skills

in laboratory work and in the analysis and interpretation of data is developed incrementally beginning at stage 1 and 2 through to the final year research project. Students will follow safety protocols relating to practical work at all stages and will prepare risk assessments as part of their research project.

❖ Methods of Assessment

Students are assessed through written reports, direct observation in the laboratory (OSPE) or field, essays and honours project thesis. Students are referred to the primary literature in support of taught modules and prepare a project-oriented review. Practical reports, completion of practical skills portfolio. Completion of /compliance with Ethical procedures, COSHH and Risk Assessments.

➢ Learning Outcomes: Transferable Skills

On the completion of this course successful students will be able to:

1- Demonstrate an ability to communicate and apply knowledge of the biological sciences to peers and non-scientists using a range of media.
2- Exhibit the personal and intellectual skills necessary for the world of employment and lifelong learning including:
   - intellectual independence,
   - self-motivation,
   - effective time management and planning,
   - an adaptable, flexible approach to learning
   - the ability to work as part of a team.
3- Demonstrate proficiency in the collation, quantitative analysis, graphical presentation, and interpretation of experimental data, and the ability to problem solve.
4- in laboratory work and in the analysis and interpretation of data is developed incrementally beginning at stage 1 and 2 through to the final year research project. Students will follow

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safety protocols relating to practical work at all stages and will prepare risk assessments as part of their research project.

❖ Credits, Grading and GPA

Babylon University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. I ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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❖ Academic Staff

Biology department staffing details				
The head of the department is occupied by (Asst. Prof. Dr. Ekhlas Al Shareefi)				
Academic Staff Information				
Notes	**Subspecialty**	**General Specialty**	**Name**	**Scientific title**
	Immunology	Ph.D. in Biology	Dr. Abdulnabi Jwaid	Professor
	Parasitology - Parasitology	Ph.D. in Biology	Dr. Ahmed Khudair	Professor
	Zoology - Histology	Ph.D. in Biology	Dr. Rafah Hadi	Professor
	Zoology - Physiology	Ph.D. in Biology	Dr. Dakhil Ghani	Professor
	Microbiology - Mycology	Ph.D. in Biology	Dr. Kawther Mohammed Ali	Professor
	Molecular and cytogenetic	Ph.D. in Biology	Dr. Ali Hussain	Professor
	Botany	Ph.D. in Biology	Dr. Hussain Jabr	Professor
	Parasitology - Parasitology	Ph.D. in Biology	Dr. Raid Abbas	Professor
	Genetic Microbiology	Ph.D. in Biology	Dr. Hasaneen Khaleel	Professor
Head of Department	Zoology - Entomology	Ph.D. in Biology	Dr. Ekhlas Mohammed Ali	Asst. Prof.
coordinator	Zoology - Physiology	Ph.D. in Biology	Dr. Hawraa Sabah	Asst. Prof.
Postgraduate coordinator	Immunology	Ph.D. in Biology	Dr. Zeena Shaker	Asst. Prof.
	Microbial Ecology	Ph.D. in Agricultural sciences	Dr. Mohammed Ibraheem	Professor
	Plant Anatomy & Classification	Ph.D. in Biology	Dr. Huda Jasim	Professor
	Pathogenic Bacteria	Ph.D. in Biology	Dr. Oruba Kadoof	Professor
	Plant Physiology	Ph.D. in Biology	Dr. Salah Ali Eidan	Asst. Prof.
	Biotechnology & Genetic engineering	Ph.D. in Biology	Dr. Israa A. Ibraheem	Professor
	Microbiology - Antigens	Ph.D. in Biology	Dr. Fatima Moain	Professor
Dean of the College	Microbiology	Ph.D. in Biology	Dr. Abeer Fawzi	Professor
	Zoology - Histology	Ph.D. in Biology	**Dr. Manar Mohammed Hassan**	Professor
Part time - PhD student	Cytology	M.Sc. in Biology	Shaimaa Ahmed	Professor
	Zoology - Physiology	Ph.D. in Biology	Dr. Shaimaa Obaid	Professor
Part time - PhD student	Microbiology	M.Sc. in Biology	Hawraa Wahab	Professor
Part time - PhD student	Immunology	M.Sc. in Biology	Ali Malik	Professor
	Microbiology - Virology	Ph.D. in Biology	Dr. Zainab Abdulnabi	Asst. Prof.
	Aquatic ecology	Ph.D. in Biology	Dr. Nadia Mahmood	Asst. Prof.
	Microbiology - Mycology	M.Sc. in Biology	Sabreen Abdulameer	Professor
	Microbiology	Ph.D. in Biology	Dr. Tasaheel Hamid	Asst. Prof.
	Biotechnology	Ph.D. in Biology	Dr. Ishraq Abdulameer	Asst. Prof.
	Industrial Microbiology	Ph.D. in Biology	Dr. Nesreen Kadhim	Asst. Prof.
	Nano-Biotechnology	Ph.D. in Biology	Dr. Sama Jawad	Asst. Prof.
Scholarship - PhD student	Microbiology	Ph.D. in Biology	Dr. Amal Raqib	Asst. Prof.
	Zoology - Entomology	M.Sc. in Biology	Nebras Mhammed Sahi	Asst. Prof.
	Microbiology	Ph.D. in Biology	Dr. Hawraa Jawad	Asst. Prof.

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Biology department staffing details				
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Academic Staff Information				
Notes	**Subspecialty**	**General Specialty**	**Name**	**Scientific title**
	Field crops	MSc. In Agricultural sciences	Ahmed Habeeb	Asst. Prof.
	Ecology	M.Sc. in Biology	Ashwaq Faleh	Lecturer
	Ecological Pollution	M.Sc. in Biology	Zaynab Hayder	Asst. Lecturer
	Ecological Pollution	M.Sc. in Biology	Worood Hamza	Asst. Lecturer
Part time - PhD student	Microbiology	M.Sc. in Biology	Sheerin Sabah	Asst. Lecturer
	Private International Law	M.Sc. in special law	Kareem Mohammed Kadhim	Lecturer
	IT	M.Sc. in Computer	Wojdan Noaman	Asst. Lecturer

❖ Calculotion of the Cumulstive Grade Point Average (CGPA)

The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a4-year B.Sc. degrees:

CGPA: (l'tmodule score x ECTS) + (2'd module score x ECTS) + ...l1240

➢ Curriculum/Modules

Executive Summary

- B.Sc. Program = 4 years = 8 Semester
- B.Sc. program = 240 ECTS
- Number of Modules per semester = 4-6 modules
- 1 modules = (4 – 8) ECTS
- 1 Semester = 16 weeks
- 1 Semester = Minimum 14 study weeks + 1 rest week + 1 Exam week
- Total SWL = SSWL + USWL (1 semester = h/w x 15 w)
- 1 ECTS = 25 hr of total SWL
- 1 Semester = 30 ECTS
- 1 Semester = 750 hr of total SWL
- 1 Week = 50 hr of total SWL

Executive Summary

Modules are classified as:

B: Basic learning activities = $\frac{1}{8}$ from total modules = 30 ECTS

S: Related or support learning activity = $\frac{2}{8}$ from total modules = 60 ECTS

C: Core learning activity
E: Elective learning activity
} = $\frac{5}{8}$ from total modules = 150 ECTS

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Level	Semester	No.1	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	BIO1101	General Zoology	علم الحيوان العام	79	71	150	6.00	C	
		2	BIO1102	Analytical Chemistry	كيمياء تحليلية	64	61	125	5.00	B	
		3	BIO1103	General Mathematics	الرياضيات العامة	34	66	100	4.00	B	
		4	BIO1104	Biophysics	فيزياء حياتية	64	61	125	5.00	B	
		5	UOB1105	Human Rights and Democracy	حقوق انسان وديمقراطية	77	48	125	5.00	S	
		6	UOB1106	Arabic Language	اللغة العربية	62	63	125	5.00	S	
						380	370	750	30.00		
	Semester	No.2	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Two	1	BIO1207	General Botany	علم النبات العام	79	46	125	5.00	C	
		2	BIO1218	Organic Chemistry	كيمياء عضوية	62	63	125	5.00	B	BIO1102
		3	BIO1209	Invertebrates	علم اللافقريات	79	46	125	5.00	C	
		4	UOB12010	Safety and bioscurity	السلامة والامن البايلوجي	62	88	150	6.00	S	
		5	UOB12011	Computer Science I	علم الحاسوب I	62	63	125	5.00	S	
		6	UOB12012	English Language I	اللغة الانكليزية I	62	38	100	4.00	S	
						406	344	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGII	Three	1	BIO21013	Entomology I	علم الحشرات I	63	112	175	7.00	C	
		2	BIO21014	Plant Anatomy	علم تشريح النبات	63	87	150	6.00	C	
		3	BIO21015	Parasitology	علم الطفيليات	63	87	150	6.00	C	
		5	BIO21016	Biochemistry I	كيمياء حياتية I	63	87	150	6.00	B	
		6	UOB21117	Computer Science II	علم الحاسوب II	62	63	125	5.00	S	UOB12011
						314	436	750	30.00		
	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Four	1	BIO22118	Entomology II	علم الحشرات II	64	86	150	6.00	C	BIO21013
		2	BIO22119	Plant Taxonomy	علم تصنيف النبات	64	61	125	5.00	C	BIO21014
		3	BIO22120	Biochemistry II	كيمياء حياتية II	64	61	125	5.00	B	BIO21016
		4	BIO22021	Microbiology	علم الاحياء المجهرية	63	87	150	6.00	C	
		5	UOB-22022	Research Methodology	منهجية بحث	32	68	100	4.00	S	
		6	UOB-22123	English Language II	اللغة الانكليزية II	32	68	100	4.00	S	UOB12012
						319	431	750	30.00		

➢ Contact:

Program Manager (The head of Department):

Ekhlas Al Shareefi / Ph.D. in Biology / Assistant Professor.

Email: wsci.ikhlass.m@uobabylon.edu.iq

Mobile no.: 07822114389

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Ekhlas M. A. Al Shareefi

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وصف البرنامج الدراسي – مسار بولونيا

وزارة التعليم العالي والبحث العلمي / العراق

جامعة بابل

كلية العلوم للبنات

الدورة الاولى – لنيل درجة البكالوريوس

قسم علوم الحياة

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❖ بيان الرسالة والرؤية

تماشياً مع رسالة الجامعة، تتمثل الرؤية الأكاديمية لكلية العلوم البيولوجية في السعي إلى تعليم وتعلم وبحث علمي على أعلى مستويات التميز العالمية. هدفنا هو مواصلة تقديم البحث والتدريس على أعلى المستويات، والعمل بطرق مبتكرة لتحقيق التميز المستمر.

تتنوع الأبحاث والتدريس التي تُجرى في كلية العلوم البيولوجية، وتغطي علوم الحيوان والإنسان والنبات والميكروبات، من المستويات الذرية والجزيئية والخلوية، وصولاً إلى الأنسجة والأعضاء والكائنات الحية الكاملة والسكان والنظم البيئية والتنوع البيولوجي والسلوك البشري. ويؤثر هذا البحث على الصحة والأمراض في مختلف الأنواع، والزراعة، والحفاظ على البيئة، بالإضافة إلى التكنولوجيا الحيوية.

- رسالتنا

خدمة مجتمعاتنا، سواءً في عالمنا أو أمتنا أو بلدنا أو جامعاتنا، من خلال تعزيز فهم الكائنات الحية وتفاعلاتها مع البيئة من خلال البحث العلمي، وتوفير تعليم عالي الجودة في علم الأحياء، مع التركيز على التعلم التجريبي وحل المشكلات، وتعزيز فهم الجمهور لعالم الأحياء من خلال أنشطة توعوية تعليمية للطلاب من جميع الأعمار.

- رؤيتنا

سيكون قسم العلوم البيولوجية رائدًا في اكتساب المعرفة الأساسية المتعلقة بعالم الأحياء، والتي من شأنها تعزيز صحة كوكبنا، بما في ذلك صحة الإنسان. سنعمل على دمج التعليم والبحث بشكل كامل، بحيث لا يقتصر تعليم جميع الطلاب على التعلم فحسب، بل يُسهمون أيضًا، من خلال تعلمهم، بفعالية في فهمنا للحياة.

❖ أهدافنا الاستراتيجية

✓ تعزيز جهودنا البحثية في المجالات الناشئة في العلوم البيولوجية، وتطوير مراكز تعليمية معترف بها وطنياً لبرامج البكالوريوس والدراسات العليا.

جامعة بابل - كلية العلوم للبنات
رئاسة قسم علوم الحياة

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Ekhlas M. A. Al Shareefi
The Head of Department

- ✓ زيادة استقطاب ودعم أعضاء هيئة التدريس المبتكرين والمتميزين، الذين سيساهمون من خلال البحث والتدريس في تطوير العلماء والأخصائيين الصحيين والمسؤولين الحكوميين ومرشدي المستقبل.
- ✓ تهيئة بيئة محفزة، حيث يُحفز التدريس والبحث والخدمة طلابنا على العمل كقادة لشعب هذا البلد.
- ✓ إثراء بيئتنا الإقليمية بتطوير برامج علمية تشمل فرص مشاركة مجتمعاتنا المحلية.

❖ مواصفات البرنامج

Program Code:	BIO	ECTS:	240
Durations:	4 levels & 8 Semesters	Method and attendance:	Full time

يُقدَّم برنامج البرمجة على أربع مراحل، كل منها تتضمن سنة دراسية كاملة، حيث يتعين على الطالب خلالها دراسة مقررات دراسية تتراوح قيمتها بين أربع وست وحدات دراسية (تعادل الوحدة الواحدة تقريبًا ٢٥ ساعة معتمدة). يعتمد المنهج الدراسي على مجموعة أساسية من الوحدات الإلزامية التي تمتد عبر المراحل الأربع، مما يوفر قاعدة عريضة من المعرفة في علم الأحياء.

يتضمن المستوى الأول مجموعة مختارة من المقررات الأساسية والأساسية والداعمة، ويسعى إلى توفير مقدمة شاملة لهذا الموضوع. تتناول هذه المقررات الموضوعات الرئيسية لمفاهيم علم الحيوان، وعلم النبات، والكيمياء التحليلية والعضوية، إلى جانب الفيزياء الحيوية، والإحصاء الحيوي، وعلوم الحاسوب، والسلامة والأمن الحيوي. في المستوى الثاني، يدرس الطلاب المزيد من المقررات البيولوجية الأساسية والأساسية والداعمة، بما في ذلك علم الحشرات، وتشريح النبات وتصنيفه، واللافقاريات والطفيليات، والكيمياء الحيوية، وعلم الأحياء الدقيقة. تتجاوز هذه المقررات المقررات الأساسية في المرحلة الأولى، وتمكن الطلاب من التخصص أو الحفاظ على مبرمج ذي قاعدة عريضة. كما توفر هذه المقررات أساسًا لخيارات التخصص القائمة على البحث في المرحلة الثالثة. في المستوى الثالث، يدرس الطلاب مقررات أساسية أخرى في علم الأحياء، تشمل علم الخلية وعلم الوراثة، وعلم البيئة والتلوث، وعلم أنسجة الحيوان وعلم وظائف الأعضاء، وعلم المناعة، وعلم وظائف الأعضاء النباتية، وعلم وظائف الأعضاء الميكروبية، ومنهجية البحث. تعكس معظم هذه المقررات اهتمامات أعضاء هيئة التدريس البحثية، وجميعهم متخصصون في مجالاتهم. في المستوى الرابع، يدرس الطلاب مقررًا أساسيًا آخر في علم الأحياء،

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مثل علم الأحياء الجزيئي، وعلم البكتيريا المسببة للأمراض، وعلم الفطريات، وعلم التشريح المقارن، وعلم الوراثة الميكروبية، وعلم الفيروسات، وعلم الأحياء الدقيقة الصناعية والغذائية، بالإضافة إلى اختيار مقررين من بين الخيارات المتاحة في مجال الكائنات الحية والجزيئية. كما يُكمل الطلاب مشروع بحث فرديًا، يوفر تدريبًا في مجال بحثي متخصص، بالإضافة إلى مهارات عامة مثل العمل المستقل، والبحث في المراجع، وكتابة التقارير، واستخدام معالجة النصوص، والرسومات، والإحصاءات. يتم اختيار الخيارات بالتشاور مع مشرف الطالب.

- الأهداف التعليمية للبرنامج

صُمم برنامج بكالوريوس العلوم مع مرتبة الشرف في العلوم البيولوجية لتزويد الخريجين بمعرفة متعمقة تتعلق بتنوع وتعقيد الكائنات الحية وتفاعلاتها. يتيح هذا المقرر للطلاب دراسة الحياة (البكتيرية، والفطرية، والنباتية، والحيوانية) على المستوى الجزيئي، وصولاً إلى دراسة التجمعات السكانية والنظم البيئية بأكملها.

1 -إظهار معرفة وفهم واسعين للمفاهيم والنظريات المتعلقة بالعلوم البيولوجية، بدءًا من الجوانب الجزيئية والخلوية وصولًا إلى الكائن الحي ككل.

2 -إظهار مجموعة من المهارات المعملية العملية المتعلقة بفحص ومعالجة المواد البيولوجية، والقياسات الفيزيائية والكيميائية والبيولوجية ذات الصلة بالعلوم البيولوجية، وتطبيق هذه المهارات في بيئة مشروع بحثي.

3 -إظهار الكفاءة في جمع البيانات التجريبية وتحليلها الكمي وتفسيرها، والقدرة على حل المشكلات.

4 -إظهار القدرة على التواصل وتطبيق المعرفة في العلوم البيولوجية.

5- إظهار الكفاءة في استخدام الحاسوب لإدارة البيانات وعرضها. يعتمد البرنامج على بيئة بحثية فعّالة، ويهدف إلى تمكين جميع الطلاب من تطوير معارف شاملة متخصصة، ومهارات عملية وقابلة للتطبيق في المجالات الأساسية لعلم الحيوان، وعلم الوراثة، وعلم الأحياء الخلوية، والكيمياء الحيوية، وعلم الأحياء الدقيقة، مع تشجيع التفكير الإبداعي والابتكار. عند إتمام البرنامج، سيكتسب الطلاب الناجحون المعرفة والخبرة اللازمتين لمتابعة مسيرة بحثية أو مهنية أخرى في مجال العلوم البيولوجية.

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- مخرجات التعلم: المهارات المعرفية

عند إتمام هذه الدورة، سيتمكن الطلاب الناجحون من:

1 -تحليل الأدبيات العلمية وتلخيصها وتقييمها نقديًا.

2 -تطبيق المعرفة والفهم الموضوعي لبناء فرضيات لمعالجة المشكلات المألوفة وغير المألوفة.

3 -إظهار القدرة على التقييم النقدي لملاءمة مختلف المناهج لحل المشكلات، وتقدير حدود الفرضيات الحالية.

4- إدراك أهمية النزاهة الأكاديمية والبحثية والقضايا الأخلاقية للتحقيقات.

❖ أساليب واستراتيجيات التدريس والتعلم

يتم تحقيق النتائج من خلال المحاضرات، والدروس العملية، والمناقشات، والعمل الميداني، والدروس الخصوصية، والعمل الجماعي، ومشاريع التخرج، والتعلم عبر الإنترنت من خلال بيئة التعلم الافتراضية بالجامعة، والدراسة المستقلة.

❖ طرق التقييم

يتم تقييم الطلاب من خلال الاختبارات الصفية، والامتحانات التحريرية غير الرسمية، والتقارير العملية، والعروض الشفوية، والمقالات، والملصقات، ودراسات الحالة، وتحليل البيانات، وأطروحة المشروع.

- مخرجات التعلم: المعرفة والفهم

عند إتمام هذه الدورة، سيتمكن الطلاب الناجحون من:

-1إظهار فهمٍ وإدراكٍ واسعين للنظريات والمفاهيم الرئيسية في العلوم البيولوجية.

-2إظهار معرفةٍ وفهمٍ لأوجه التشابه والتنوع بين الكائنات الحية والعمليات التي تدعم الحياة على الأرض.

-3إظهار معرفةٍ وفهمٍ للعلوم البيولوجية، من الناحية الجزيئية إلى الكائن الحي ككل، استنادًا إلى موضوع التطور والانتقاء الطبيعي المتكرر.

-4إظهار وعيٍ نقديٍ بالأساس الجزيئي لعلم الوراثة وعلم الأحياء الجزيئي.

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❖ أساليب واستراتيجيات التدريس/ التعلم

يتم توفير التعلم والتعليم القائم على المعرفة في مواد دراسية محددة من خلال المحاضرات، والدروس العملية، والمناقشات، والعمل الميداني، والدروس الخصوصية، والعمل الجماعي، ومشاريع التخرج، والتعلم عبر الإنترنت من خلال الدراسة المستقلة في الجامعة.

❖ طرق التقييم

يتم تقييم الطلاب من خلال الاختبارات الكتابية غير الرسمية، واختبارات الفصل، والتقارير العملية، والعروض الشفوية، والمقالات، والملصقات، وأبحاث المشاريع.

➢ مخرجات التعلم: مرتبطة بموضوع الدراسة

عند إتمام هذه الدورة، سيتمكن الطلاب الناجحون من:

1- فهم الأدبيات العلمية المتعلقة بالعلوم البيولوجية ودمج المعلومات منها لمعالجة المشكلات، وصياغة الفرضيات واختبارها.

2- تصميم وتقييم وتنفيذ التجارب في مختبر العلوم البيولوجية و/أو الميدان.

3- توثيق البيانات وعرضها، باستخدام التحليل الإحصائي المناسب.

4- الالتزام بلوائح الصحة والسلامة وإجراءات الأخلاقيات المتعلقة بنوع المشروع و/أو البيئة العملية.

5- إتقان استخدام تكنولوجيا المعلومات للوصول إلى قواعد البيانات والأدبيات العلمية، ومعالجة البيانات وتقديمها، بالإضافة إلى المهام الكتابية.

❖ أساليب واستراتيجيات التدريس/التعلم

يتم تطوير مهارات العمل المختبري وتحليل البيانات وتفسيرها تدريجيًا بدءًا من المرحلتين الأولى والثانية وحتى مشروع البحث في السنة النهائية. سيتبع الطلاب بروتوكولات السلامة المتعلقة بالعمل العملي في جميع المراحل وسيقومون بإعداد تقييمات المخاطر كجزء من مشروع البحث الخاص بهم.

❖ طرق التقييم

يُقيّم الطلاب من خلال التقارير الكتابية، والملاحظة المباشرة في المختبر (OSPE) أو الميدان، والمقالات، وأطروحة مشروع التخرج. يُحال الطلاب إلى المراجع الأساسية لدعم الوحدات الدراسية

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المُدرّسة، ويُعدّون مراجعةً مُوجّهة نحو المشروع. تشمل هذه المراجع التقارير العملية، وإكمال ملف المهارات العملية، والامتثال للإجراءات الأخلاقية، وتقييماتCOSHH ، وتقييمات المخاطر.

- مخرجات التعلم: مهارات قابلة للنقل

عند إتمام هذه الدورة، سيتمكن الطلاب الناجحون من:

-1إظهار القدرة على التواصل وتطبيق معارف العلوم البيولوجية مع أقرانهم وغير العلماء باستخدام مجموعة متنوعة من الوسائط.

-2إظهار المهارات الشخصية والفكرية اللازمة لعالم العمل والتعلم مدى الحياة، بما في ذلك:

- الاستقلال الفكري،
- التحفيز الذاتي،
- الإدارة والتخطيط الفعالين للوقت،
- اتباع نهج مرن وقابل للتكيف في التعلم،
- القدرة على العمل ضمن فريق.

٣ -إظهار الكفاءة في جمع البيانات التجريبية وتحليلها الكمي وعرضها بيانيًا وتفسيرها، والقدرة على حل المشكلات.

٤ -يتم تطوير مهارات العمل المخبري وتحليل البيانات وتفسيرها تدريجيًا بدءًا من المرحلتين الأولى والثانية وحتى مشروع البحث النهائي. سيتبع الطلاب بروتوكولات السلامة المتعلقة بالعمل العملي في جميع المراحل، وسيُعدّون تقييمات للمخاطر كجزء من مشروع بحثهم.

- الساعات المعتمدة، الدرجات، والمعدل التراكمي

تتبع جامعة بابل عملية بولونيا من خلال نظام تحويل الساعات المعتمدة الأوروبي .(ECTS) يبلغ إجمالي عدد الساعات المعتمدة في برنامج الدرجة 240 ساعة معتمدة، بمعدل 30 ساعة معتمدة في الفصل الدراسي. تعادل ساعة معتمدة واحدة 25 ساعة من عبء العمل الطلابي، بما في ذلك عبء العمل المنظم وغير المنظم.

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❖ الدرجات

قبل التقييم، تُقسّم النتائج إلى مجموعتين فرعيتين: ناجح وراسب. لذلك، لا تعتمد النتائج على الطلاب الذين رسبوا في أي مقرر. يُعرّف نظام الدرجات على النحو التالي:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

ملاحظة: سيتم تقريب الأرقام العشرية التي تزيد أو تقل عن ٠,٥ إلى العلامة الكاملة الأعلى أو الأدنى (على سبيل المثال، سيتم تقريب علامة ٥٤,٥ إلى ٥٥، بينما سيتم تقريب علامة ٥٤,٤ إلى ٥٤). لدى الجامعة سياسة لا تسمح بحالات الرسوب القريبة من النجاح، لذا فإن التعديل الوحيد للعلامات الممنوحة من قبل المصححين الأصليين سيكون التقريب التلقائي الموضح أعلاه.

❖ الكادر التدريسي

تفاصيل ملاك القسم العلمي للعام الدراسي 2024-2025

رئيس القسم مشغول من قبل الاستاذ المساعد الدكتور (اخلاص محمدعلي الشريفي)

معلومات عن التدريسيين للعام الدراسي 2024-2025

ت	المرتبة العلمية	الاسم	الاختصاص العام	الاختصاص الدقيق	ملاحظات اخرى
.1	استاذ	د. عبد النبي جويد عبد	علوم حياة	مناعة	
.2	استاذ	د. احمد خضير الحميري	علوم حياة	طفيليات	اعارة الى جامعة المستقبل
.3	استاذ	د. رفاه هادي لطيف	علوم حياة	علم الحيوان – انسجة حيوانية	
.4	استاذ	د. داخل غاتي عمران	علوم حياة	حيوان – فسلجة حيوانية	
.5	استاذ	د. كوثر محمد علي	علوم حياة	احياء مجهرية	معاون العميد العلمي
.6	استاذ	د. علي حسين محمد	علوم حياة	وراثة جزيئية وخلوية	
.7	استاذ	د. حسين جبر حسين	علوم حياة	علم النبات	
.8	استاذ	د. حسنين خليل ابراهيم	علوم حياة	احياء مجهرية - وراثة احياء مجهرية	اعارة الى جامعة المستقبل
.9	استاذ	د. رائد عباس كاظم	علوم حياة	علم الحيوان - طفيليات	
.10	استاذ مساعد	د. اخلاص محمد علي	علوم حياة	علم الحيوان - حشرات	رئيس القسم

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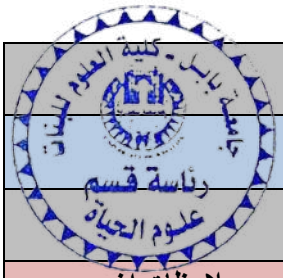

تفاصيل ملاك القسم العلمي للعام الدراسي 2024-2025

رئيس القسم مشغول من قبل الاستاذ المساعد الدكتور (اخلاص محمدعلي الشريفي)

معلومات عن التدريسيين للعام الدراسي 2024-2025

ت	المرتبة العلمية	الاسم	الاختصاص العام	الاختصاص الدقيق	ملاحظات اخرى
.11	استاذ مساعد	د. حوراء صباح مهدي	علوم حياة	علم الحيوان – فسلجة حيوانية	
.12	استاذ مساعد	د. زينة شاكر خليل	علوم حياة	احياء مجهرية / مناعة	
.13	استاذ	د. محمد ابراهيم	علوم زراعية	بيئة احياء مجهرية	
.14	استاذ	د. هدى جاسم محمد	علوم حياة	تصنيف وتشريح نبات	
.15	استاذ	د. عروبة كطوف حسين	علوم حياة	احياء مجهرية / بكتريا مرضية	
.16	استاذ مساعد	د.صلاح علي عيدان	علوم حياة	فسلجة نباتية	
.17	استاذ	د. اسراء عدنان ابراهيم	علوم حياة	هندسة وراثية وتقنيات احيائية	
.18	استاذ مساعد	د. فاطمة معين عباس	علوم حياة	احياء مجهرية	
.19	استاذ	د. عبير فوزي مراد	علوم حياة	احياء مجهرية	عميد الكلية
.20	استاذ مساعد	د. منار محمد حسن	علوم حياة	علم الحيوان – انسجة حيوانية	
.21	استاذ	أ. شيماء احمد رحيم	علوم حياة	علم الخلية	
.22	استاذ مساعد	د. شيماء عبيد عبد الله	علوم حياة	علم الحيوان - فسلجة وعلم الدم	
.23	استاذ	أ. حوراء وهاب عزيز	علوم حياة	احياء مجهرية	
.24	استاذ	أ. علي مالك سعد	علوم حياة	احياء مجهرية - مناعة	مقرر القسم
.25	استاذ مساعد	د.زينب عبد النبي طليفح	علوم حياة	احياء مجهرية / فايروسات	
.26	استاذ مساعد	د. نادية محمود	علوم حياة	بيئة مائية	
.27	استاذ مساعد	د. نادية حميد عبد عون	علوم حياة	تقانة احيائية	
.28	استاذ مساعد	د. احسان فليح حسين	علوم حياة	احياء مجهرية – مضادات حيوية	مقرر العليا في القسم
.29	استاذ	أ. صابرين عبد الأمير	علوم حياة	احياء مجهرية - فطريات	
.30	استاذ مساعد	د. تساهيل حامد كاظم	علوم حياة	احياء مجهرية	
.31	استاذ مساعد	د. اشراق عبد الأمير	علوم حياة	تقانة حياتية	
.32	استاذ مساعد	د. نسرين كاظم راضي	علوم حياة	احياء مجهرية صناعية	
.33	استاذ مساعد	د. سما جواد	علوم حياة	نانوبايوتكنولوجي	
.34	استاذ مساعد	د. امال راقب شمران	علوم حياة	احياء مجهرية	بعثة دراسية – طالبة دكتوراه
.35	استاذ مساعد	أ.م. نبراس محمد	علوم حياة	حيوان - حشرات	
.36	استاذ مساعد	د. حوراء جواد كاظم	علوم حياة	احياء مجهرية	
.37	استاذ مساعد	أ.م. احمد حبيب ياس	علوم زراعية	محاصيل حقلية	
.38	مدرس	د. اشواق فالح خزعل	علوم حياة	بيئة وتلوث	
.39	مدرس	م. اسراء عدنان عوده	علوم حياة	حيوان – تشريح مقارن	
.40	مدرس مساعد	م.م. زينب حيدر	علوم حياة	تلوث بيئي	
.41	مدرس مساعد	م.م. ورود حمزة	علوم حياة	تلوث بيئي	
.42	مدرس مساعد	م.م. شيرين صباح	علوم حياة	احياء مجهرية	
.43	مدرس مساعد	م.م. ورود علوان	علوم حياة	حيوان / طفيليات	

ASST. PROF. Dr.
Ekhlas M. A. Al Shareefi
The Head of Department

تفاصيل ملاك القسم العلمي للعام الدراسي 2024-2025					
رئيس القسم مشغول من قبل الاستاذ المساعد الدكتور (اخلاص محمدعلي الشريفي)					
معلومات عن التدريسيين للعام الدراسي 2024-2025					
ت	المرتبة العلمية	الاسم	الاختصاص العام	الاختصاص الدقيق	ملاحظات اخرى
.44	مدرس مساعد	م.م. رلى ظاهر	علوم حياة	نبات / تشريح نبات	
.45	مدرس مساعد	م.م. وجدان نعمان	حاسبات	اختصاصات ساندة	
.46	مدرس مساعد	م.م. كريم محمد	قانون	اختصاصات ساندة	
.47	مدرس مساعد	م.م. مازن عيدان هادي	علوم حياة	تقنيات احيائية	
.48	مدرس مساعد	م.م ندى عقيل	علوم بيئية	سموم غذائية	
.49	مدرس مساعد	م.م. اوراس عبد السيد	علوم حياة	نبات	
.50	مدرس مساعد	م.م. فرح محمد سعيد	علوم حياة	فطريات	
.51	مدرس مساعد	م.م. علا سعد علي	قانون	قانون جنائي	
.52	مدرس مساعد	م.م. ايات عمار	علوم حياة	بيئة وتلوث (تنسيب)	
.53	مدرس مساعد	م.م. ضحى مهدي	علوم حياة	حيوان (تنسيب)	

❖ المواد الدراسية للمرحلتين الاولى والثانية – مسار بولونيا

Level	Semester	No.1	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGI	One	1	BIO1101	General Zoology	علم الحيوان العام	79	71	150	6.00	C	
		2	BIO1102	Analytical Chemistry	كيمياء تحليلية	64	61	125	5.00	B	
		3	BIO1103	General Mathematics	الرياضيات العامة	34	66	100	4.00	B	
		4	BIO1104	Biophysics	فيزياء حياتية	64	61	125	5.00	B	
		5	UOB1105	Human Rights and Democracy	حقوق انسان وديمقراطية	77	48	125	5.00	S	
		6	UOB1106	Arabic Language	اللغة العربية	62	63	125	5.00	S	
						380	370	750	30.00		
	Semester	No.2	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Two	1	BIO1207	General Botany	علم النبات العام	79	46	125	5.00	C	
		2	BIO1218	Organic Chemistry	كيمياء عضوية	62	63	125	5.00	B	BIO1102
		3	BIO1209	Invertebrates	علم اللافقريات	79	46	125	5.00	C	
		4	UOB12010	Safety and bioscurity	السلامة والامن البايلوجي	62	88	150	6.00	S	
		5	UOB12011	Computer Science I	علم الحاسوب I	62	63	125	5.00	S	
		6	UOB12012	English Language I	اللغة الانكليزية I	62	38	100	4.00	S	
						406	344	750	30.00		

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Biology

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
UGII	Three	1	BIO21013	Entomology I	علم الحشرات I	63	112	175	7.00	C	
		2	BIO21014	Plant Anatomy	علم تشريح النبات	63	87	150	6.00	C	
		3	BIO21015	Parasitology	علم الطفيليات	63	87	150	6.00	C	
		5	BIO21016	Biochemistry I	كيمياء حياتية I	63	87	150	6.00	B	
		6	UOB21117	Computer Science II	علم الحاسوب II	62	63	125	5.00	S	UOB12011
						314	436	750	30.00		
	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
	Four	1	BIO22118	Entomology II	علم الحشرات II	64	86	150	6.00	C	BIO21013
		2	BIO22119	Plant Taxonomy	علم تصنيف النبات	64	61	125	5.00	C	BIO21014
		3	BIO22120	Biochemistry II	كيمياء حياتية II	64	61	125	5.00	B	BIO21016
		4	BIO22021	Microbiology	علم الاحياء المجهرية	63	87	150	6.00	C	
		5	UOB-22022	Research Methodology	منهجية بحث	32	68	100	4.00	S	
		6	UOB-22123	English Language II	اللغة الانكليزية II	32	68	100	4.00	S	UOB12012
						319	431	750	30.00		

ASST. PROF. Dr.
Ekhlas M. A. Al Shareefi
The Head of Department

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	CHORDATES				
Module Type	CORE		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**		
Module Code	UOBAB0601074				
ECTS Credits	8				
SWL (hr/sem)					
Module Level			**Semester of Delivery**		
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Hawraa Sabah Al-Musawi		**e-mail**	wsci.hawraa.s@uobabylon.edu	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**		

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Study of the organisms belonging to the phylum Chordata 2. Classification of these organisms into primary chordates and vertebrates 3. Learn about the composition and characteristics of these organisms 4. Comparison of these organisms anatomically
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A- Knowledge and understanding**: 1. Learn the principles of taxonomy. 2. The student should get acquainted with the organisms belonging to the Chordata phylum 3. The ability to classify these organisms 4. To be able to compare structurally and behaviorally between them 5.Know the rules for writing the scientific name. **B- Subject-specific skills:** 1. Explain the differences between organisms and link them with environmental variables 2. The evolutionary link between the ancestors and the current generations 3. To have the ability to dissect laboratory animals 4. The student should be familiar with the materials used in mummification 5. Making skeletons for some animals and mummifying others
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Students must wear lab gowns, gloves and masks 2. Handle with care laboratory chemicals 3. Do not use the mobile device inside the laboratory 4. Do not eat food and drinks inside the laboratory 5. Ensure that tools and hands are sterilized before and after work

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	A. Theoretical lectures B. Practical laboratories C. Films and slideshows D. Scientific trips for field application

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Lecture. 1: Concept anatomy, comparative anatomy, and chordates

Week 2	Lecture 2: Origin of chordate
Week 3	Lecture 3: Classification of chordate
Week 4	Lecture 4: Subphylum :hemichordate
Week 5	Lecture 5: Subphylum : Cephaochordata
Week 6	Exam
Week 7	Lecture 6: Subphylum: Vertebrata
Week 8	Lecture 7: super class : Agnatha
Week 9	Lecture 8: Super class : Gnatha
Week 10	Lecture 9: Superclass : Gnathostomata
Week 11	Lecture 10: Super class: Tetrapoda, Class: Amphibia
Week 12	Lecture 11: Class: Reptilia
Week 13	Lecture 12: Class :Aves
Week 14	Lecture 13: Class: Mammalia
Week 15	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Classification of chordata 1
Week 2	Lab 2: Classification of chordata 2
Week 3	Lab 3: Anatomy of Amphioxus
Week 4	Lab 4: Anatomy of sea lamprey
Week 5	Lab 5: Anatomy of spiny dog fish
Week 6	Exam
Week 7	Lab 6: Anatomy of bony fish
Week 8	Lab 7: Anatomy of frog
Week 9	Lab 8: Anatomy of Turtle 1
Week 10	Lab 9: Anatomy of Turtle 2
Week 11	Lab 10: Anatomy of pigeon 1
Week 12	Lab 11: Anatomy of pigeon 2
Week 13	Lab 12: Anatomy of Rabbit 1
Week 14	Lab 13: Anatomy of Rabbit 2
Week 15	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Fundamentals of Comparative Anatomy of Chordates Dr. Shukri Habib • Principles of Animal Taxonomy. Author,Ashok Verma . 2015 • Invertebrate life. Translated by Salman Dawood Salman, Yahya Touma Dawood and Balsam Anis Hanna - University of Basra 2016	No
Recommended Texts	• The living marine resources of Kuwait, eastern Saudi Arabia, Bahrain, Qater, and united arab Emarates.Author,Kent E.capenter.1997	No
Websites	- The Internet	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	حقوق الانسان والديمقراطية HUMAN RIGHTS AND DEMOCRACY			**Module Delivery**	
Module Type	BASIC			**Theory** **Lecture** **Seminar**	
Module Code	UOBAB0601015				
ECTS Credits	4				
SWL (hr/sem)					
Module Level	1		**Semester of Delivery**	1	
Administering Department			**College**	Sciw	
Module Leader	Karim Muhammad Kazem		**e-mail**	kahreem.kahdem@uobabylon.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	Ms.c	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval	01/06/2023		**Version Number**		

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Introducing the concept of right, human beings, and human rights, and explaining the historical development of the idea of human rights. 2- Introducing the intellectual contribution to the development of human rights, clarifying the types of public rights and freedoms, and the position of some international agreements and some comparative constitutions on these rights and freedoms. 3- A statement of human rights in the declarations of rights, regional documents, and the Iraqi constitution (in force). 4- Statement of means of protecting human rights. 5- Statement of the concept of democracy. 6- Defining the forms of democracy and the types of governments based on the means of assigning power and the types of political systems based on the principle of separation of powers and its development. 7- Introducing the legal state. 8- Introducing political parties. 9- Explanation of the Iraqi Parliament Elections Law No. (9) for the year 2020, an explanation of the concept of elections, its legal adaptation, and the organization of the election process. 10- Statement of the crimes of the defunct Baath Party at the local and international levels, the elements of these material and moral crimes and their implications. 11- A statement of the constitutional and legal texts according to which the defunct Baath Party was banned and prevented from returning to power or political life and not allowing it to be within the political and partisan pluralism in Iraq.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- The student should know the concept of right, human rights and human rights, and explain the historical development of the idea of human rights. 2- The student should know the intellectual contribution to the development of human rights, the types of public rights and freedoms, and the position of some international agreements and some comparative constitutions on these rights and freedoms. 3- That the student knows human rights in the declarations of rights, regional documents, and the Iraqi constitution (in force). 4- That the student knows the means of protecting human rights. 5- The student should know the concept of democracy. 6- The student should know the forms of democracy and the types of

	governments based on the means of assigning power and the types of political systems based on the principle of separation of powers and its development. 7- The student should know the legal state and political parties. 8- The student should know the contents of the Iraqi Parliament Elections Law No. (9) of 2020. 9- The student should know the concept of election, its legal adaptation, and the organization of the election process. 10- The student should know the crimes of the defunct Baath Party at the local and international levels, the elements of these material and moral crimes and their implications. 11- The student should know the constitutional and legal provisions according to which the defunct Baath Party was banned and prevented from returning to power or political life and not allowing it to be part of the political and partisan pluralism in Iraq.
Indicative Contents المحتويات الإرشادية	**We will address the topics of the article according to the following topics:** The first topic: It is related to the nature of human rights, the historical development of them, the intellectual contribution to the development of these rights, the types of public rights and freedoms, the position of some international agreements on them, as well as the position of comparative constitutions, and the means to protect these rights and freedoms. [14 hours]. The second topic: which is related to the concept of democracy and its forms and types of governments based on the means of assigning power and the types of political systems based on the principle of separation of powers and the legal state and the contents of the Iraqi Parliament Elections Law No. (9) for the year 2020 and the concept of elections and its legal adaptation and organization of the election process. [8 hours]. The third topic: which is related to demonstrating the crimes of the defunct Baath Party committed at the local and international levels, clarifying the material and moral elements of these crimes and their implications, and clarifying the constitutional and legal texts according to which the defunct Baath Party was banned and prevented from returning to power or political life and not allowing it to be part of Political and partisan pluralism in Iraq. [8 hours].
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in presenting this course will be by giving lectures and encouraging students to actively participate in the lecture and put forward their opinions. In order to enrich the learning and teaching process, we will also use the method of scientific presentations.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	100	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	The concept of right and human and the concept of human rights.
Week 2	The idea of human rights in the Middle Ages and the Renaissance and in divine laws.
Week 3	Intellectual contribution to the development of human rights in ancient times, the Middle Ages, the Renaissance and the early modern era.
Week 4	Types of public rights and freedoms, the position of some international agreements and some comparative constitutions.
Week 5	Human rights in declarations of rights and regional documents.
Week 6	Legal, economic and political means to protect human rights.
Week 7	Mid-term Exam + Review the topics of the previous article.
Week 8	The concept of democracy (development - definition - limits)

Week 9	Types of Democracy.
Week 10	Types of government based on the means of delegating power.
Week 11	Types of political systems based on the principle of separation of powers and its development.
Week 12	The crimes of the defunct Baath Party that violate political freedoms inside Iraq and the crimes of provoking sectarian strife among the Iraqi people.
Week 13	The crimes of the defunct Baath Party committed against humanity, its crimes against religious feeling, and its crimes against the Iraqi environment.
Week 14	International crimes of the defunct Baath Party.
Week 15	Law No. (32) of 2016 ((Law of Prohibiting the Baath Party, Entities, Parties, and Racist, Terrorist, and disbeliever Activities))
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Dr . Maher Salih Allawi and others, human and child rights and democracy, printed at the expense of Tikrit University, 2009.	Yes
Recommended Texts	1: Dr . Ahmed Fathi Sorour, Constitutional Protection of Rights and Freedoms, Dar Al-Shorouk, 1st edition, Cairo, 1999.	No

	2: Dr. Edmond Rabat, Democracy in the Arab Countries Through Its Constitutional Development, Publications of the Lebanese Association for Political Science, Beirut, 1960. 3: Dr. Sajer Nasser Hamad, Political and Islamic Human Rights and Global Systems, Dar Al-Kutub Al-Alami, 1st Edition, Beirut, 2005. 4: Dr. Muhammad Al-Tarawneh and others, International Humanitarian Law, International Committee of the Red Cross, Amman, 2005. .	
Websites	• :https://iraqld.e-sjc-services.iq • : https://www.un.org/ar/universal-declaration-human-rights	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C –Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	CELL BIOLOGY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601051				
ECTS Credits					
SWL (hr/sem)					
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Hasanain Khaleel Ibrahim		**e-mail**	wsci.hassanein.k@uobabylon.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Ahmed Habeeb Al mamoori		**e-mail**	wsci.ahmed.habeeb@uobabylon.edu.iq	
Review Committee Approval			**Version Number**		

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. Study the structure and chemistry of the cell and fine molecules. 2. Illustrate the structures of large molecules such as protein and DNA. 3. Illustrate the cell component under microscope. 4. Illustrate the role and function of all component inside cell. 5. Statement of the role of chromosomes 6. Explain the specifications of the chromosomal body 7. Phases of division in the cell. 8. Relationship between division		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles 2. Students will understand how these cellular components are used to generate and utilize energy in cells. 3- Students understand the basic organelles in the cell and the function of each organelle. 3. Students will understand the cellular components underlying cell cycle, mitotic and cell division.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: •General Introduction to cell Biology. •General structure of the cell . [15 hrs.] •Cell chemistry and small molecules. • Composition of large molecules. Protein, DNA. [15 hrs.] •Structure and function of the cell wall and plasma membrane •Composition of the cytoplasm. [15 hrs.] •Composition Golgi apparatus and lysosome •Composition Chloroplast[15 hrs.] •Structure and function of ribosomes.		

	•Nucleus and Chromatin. [15 hrs.] •Cell cycle and Cell Division. •Nucleic acid structure . [15 hrs.] •Reassessment . [6hrs.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1-Teaching and curriculum design need to be focused on meeting students' future needs, implying the development in students of generic capabilities such as critical thinking, teamwork and communication skills, amongst others. 2-Students must have a thorough understanding of fundamental concepts even if that means less content is covered. 3- The relevance of what is taught must be established by using real-life, current and/or local examples and by relating theory to practice. 4-Student beliefs must be challenged to deal with misconceptions. 5- A variety of learning tasks that engage students, including student discussion, need to occur in order that meaningful learning takes place. 6- Motivate students through displaying their own enthusiasm, encouraging students and providing interesting, enjoyable and active classes. 7- Each lesson must be thoroughly planned but flexible so that necessary adaptations may be made based on feedback during the class. 8- The aims, concepts, learning activities and assessment are consistent with achieving learning outcomes related to future student needs

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	General Introduction to cell Biology
Week 2	General structure of the cell
Week 3	Cell chemistry and small molecules.
Week 4	Composition of large molecules. Protein, DNA
Week 5	Structure and function of the cell wall and plasma membrane
Week 6	Composition of the cytoplasm.
Week 7	Mid-term Exam
Week 8	Composition Golgi apparatus and lysosome
Week 9	Composition Chloroplast

Week 10	Structure and function of ribosomes
Week 11	Nucleus and Chromatin.
Week 12	Cell cycle and Cell Division.
Week 13	Nucleic acid structure
Week 14	Chromosome structure and DNA Replication
Week 15	Preparatory Week
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Safety and security instructions in the laboratory
Week 2	Lab 2: Introduction to Microscope and Cell type.
Week 3	Lab 3: Components of the cell membrane
Week 4	Lab 4: Endoplasmic Reticulum (Types, Ultrastructure and Functions)
Week 5	Lab 5: Nucleus, Nuclear Envelope, Nuclear Sap,
Week 6	Lab 6: Nucleolus and Chromosomes
Week 7	Exam
Week 8	Lab 7: Cytoplasm (Hyaloplasm, Cell organelles, Cytoskeleton Cytoplasmic, Cillia and Flagella
Week 9	Lab 8: Ribosomes and Colgi apparatus Structure
Week 10	Lab 9: The content of Cytoplasm (Inorganic Compound and Organic Compound)
Week 11	Lab 10: Chloroplast Types and structure
Week 12	Lab 11: Lysozyme structure and function
Week 13	Lab 12: Study cell division Mitosis
Week 14	Lab 13: Study cell division Meiosis
Week 15	EXAM

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	•KREITZER G. , JAULIN F. AND ESPENEL C. (2010).CELL BIOLOGY ASSAYS ESSENTIAL METHODS. Academic Press is an imprint of Elsevier. First edition. London NW1 7BY, UK. •Rogers k. (2011) The cell., Britannica Educational Publishing, First Edition New York, NY. •Gerald Karp (2010)Cell and Molecular Biology. John Wiley & Sons Inc. 6th edition United States of America. •Jeff Hardin and Gregory Bertoni .(2016) Becker´s world of the cell.9thedition .Pearson	
Recommended Texts		
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science For Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	GENETIC		**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601061			
ECTS Credits				
SWL (hr/sem)				
Module Level	1	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader	Dr. Hasanain Khaleel Ibrahim	**e-mail**	wsci.hassanein.k@uobabylon.edu.iq	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name	Ahmed Habeeb Al mamoori	**e-mail**	wsci.ahmed.habeeb@uobabylon.edu.iq	
Review Committee Approval		**Version Number**		

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1-Students will learn the basic principles of inheritance at the molecular, cellular and organismal levels. 2. Students will understand causal relationships betweenmolecule/cell level phenomena ("modern"genetics) and organism-level patterns of heredity ("classical"genetics) 3- ncrease the Student understanding about a genetic disease(s), the risks and benefits of genetic testing and disease management, and available options. 4- Identify with the individual and your family the psychosocial tools required to adjust to potential outcomes. 5-Reduce the individuals anxiety.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Comprehensive, detailed understanding of the chemical basis of heredity 2- Comprehensive and detailed understanding of genetic methodology and how quantification of heritable traits in families and populations provides insight into cellular and molecular mechanisms. 3- Understanding of how genetic concepts affect broad societal issues including health and disease, food and natural resources, environmental sustainability, etc. 4- Understanding the role of genetic mechanisms in evolution. 5- The knowledge required to to design, execute, and analyze the results of genetic experimentation in animal and plant model systems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: •Introduction to genetics. •Chromosomes , Genes and Allele[15 hrs] •Mendelian inheritance •Gene Interaction and types of Dominance. [15 hrs] . •Epistasis, Duplicate genes and Lethal genes •Sex-Linked traits •Probability and Family pedigree[15 hrs] •Replication, Transcription and Translation (Gene expression) •Genetic Diseases and chromosomal abnormalities •Mutations, types of Mutation, The genetic basis of Mutations[15 hrs] •Chromosome and Cancer

	•Mutagens •Oncogenes and Suppressor gene[15hrs.] •Reassessment . [6hrs.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1-Teaching and curriculum design need to be focused on meeting students' future needs, implying the development in students of generic capabilities such as critical thinking, teamwork and communication skills, amongst others. 2-Students must have a thorough understanding of fundamental concepts even if that means less content is covered. 3- The relevance of what is taught must be established by using real-life, current and/or local examples and by relating theory to practice. 4-Student beliefs must be challenged to deal with misconceptions. 5- A variety of learning tasks that engage students, including student discussion, need to occur in order that meaningful learning takes place. 6- Motivate students through displaying their own enthusiasm, encouraging students and providing interesting, enjoyable and active classes. 7- Each lesson must be thoroughly planned but flexible so that necessary adaptations may be made based on feedback during the class. 8- The aims, concepts, learning activities and assessment are consistent with

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to genetics
Week 2	Mendelian inheritance
Week 3	Gene Interaction and types of Dominance.
Week 4	Epistasis, Duplicate genes and Lethal genes
Week 5	Sex-Linked traits
Week 6	Probability and Family pedigree
Week 7	Mid-term Exam
Week 8	Replication, Transcription and Translation (Gene expression)
Week 9	Genetic Diseases and chromosomal abnormalities
Week 10	Mutations, types of Mutation, The genetic basis of Mutations
Week 11	Chromosome and Cancer
Week 12	Mutagens
Week 13	Oncogenes and Suppressor gene
Week 14	Preparatory Week
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Instrument and Material used in genetic Field

Week 2	Lab 2: Laboratory Safety
Week 3	Lab 3: Applications to Mendel's first and second law
Week 4	Lab 4: The genetic Material in Prokaryotic and Euckaryotic
Week 5	Lab 5: Molecular Basis of Heredity
Week 6	Lab 6: Nucleic acid (DNA & RNA)
Week 7	EXAM
Week 8	Lab 7: Karyotyping
Week 9	Lab 8: Plasmid
Week 10	Lab 9: DNA Extraction & Analysis
Week 11	Lab 10: Polymerase Chain Reaction (PCR)
Week 12	Lab 11: Linkage and crossing over
Week 13	Lab 12: Numerical and structural Chromosomal aberration
Week 14	Lab 13: Prenatal diagnosis & Genetic Counseling
Week 15	EXAM

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	•Griffiths Anthony J.F. and Susan R. Wessler (2015) An Introduction to Genetic Analysis,11 edition. Publisher: W. H. Freeman •Genetics analysis of gene and genomes 6th Edition (2005) Danial , Hertl, Elizbeth W.Jonesز Karp. G (2008)Cell and Molecular Biology,5th, editionGerald	
Recommended Texts		
Websites	https://www.werathah.com/	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Sciences for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	BOTANY (PLANT BIOLOGY)			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601021				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Prof. Dr. Hussein Jebur Hussein		**e-mail**	huss_huss@uob.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	5. Plants maintain the living environment. Without plants, the concentration of carbon dioxide in the atmosphere would increase to such an extent that humans and other animals would die. 6. Studying and understanding the student of the importance of the plant kingdom and the diversity in it. 7. Studying and knowing the most important distinguishing features of the plant kingdom from other kingdoms. 8. Studying the relationship of the plant kingdom with other organisms. 9. Study the internal anatomy of the plant and the types of tissues that make up the plant body.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge and distinction of scientific terms related to botany. 2. Introducing the economic importance of plants. 3. Introducing the importance of plants in preserving the environment. 4. Introducing the medicinal importance of the plant kingdom. 5. The importance of the plant kingdom in solving the problems of food shortage in the world.		
Indicative Contents المحتويات الإرشادية	1. Teaching the student the basic principles of writing the scientific name of a plants. 2. Know the differences between plant biology and other organisms. 3. Know the taxonomic orders that make up the plant kingdom. 4. The correct use of scientific devices and equipment in the plant laboratory. 5. Knowledge of the internal anatomy of plants and their relationship to environmental conditions.		
Learning and Teaching Strategies			

استراتيجيات التعلم والتعليم	
Strategies	One of the most important strategies that help the student to understand botany is linking botany with other sciences such as ecology, biotechnology and medical sciences, as well as making scientific field trips and collecting plant samples directly from the environment in which you live, as well as contributing to social and cultural activities such as campaigns to plant trees and flowers in the squares and parks.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to plant kingdom (Plantae)
Week 2	The Plant Cell Part I
	The Plant Cell Part II
Week 3	Cell division
Week 4	Plant tissues
Week 5	The Tissue Systems
Week 6	Stem anatomy
Week 7	Exam
Week 8	Root anatomy
Week 9	Leaf Anatomy
Week 10	Types of Vascular Bundles
Week 11	Plant Defense
Week 12	Photosynthesis
Week 13	Respiration
Week 14	Plant pigments
Week 15	Secondary Metabolites
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Laboratory safety and security guidelines
Week 2	Instructions for the use of scientific equipment
Week 3	Types of microscopes and the correct ways to use them
Week 4	The Plant Cell Part I
Week 5	The Plant Cell Part II
Week 6	Cell division
Week 7	Plant tissues (Part I)
Week8	Plant tissues (Part II)
Week9	The Tissue Systems
Week10	Types of Vascular Bundles

Week11	Anatomy of stem
Week12	Anatomy of root
Week13	Anatomy of leaf
Week14	Plants Pigments
Week15	Osmosis
Week16	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Taiz, L., & Zeiger, E. (2013). Plant Physiology= Fisiologia Vegetal. *Collecció Ciències experimentals; 10*. • Evert RF. Esau's plant anatomy: meristems, cells, and tissues of the plant body: their structure, function, and development. John Wiley & Sons; 2006 Aug 28.	Yes
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded

(0 – 49)	**F –** Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Sciences for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	PLANT GROUPS (ALGAE)			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601035				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Prof. Dr. Hussein Jebur Hussein		**e-mail**	huss_huss@uob.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	10. Familiarize students with the scientific terminology of algae 11. Study of the classification of algae 12. Studying the relationship of Phycology with other sciences 13. Study the importance of algae to humans 14. A study of the importance of food security and an alternative source of fuel 15. Studying the importance of algae in environmental pollution
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	6. Creating a conscious generation capable of distinguishing between higher and lowering plants. 7. Creating a conscious and empowered generation capable of working and innovating in the various sectors of the country. 8. Creating a conscious, empowered generation capable of working and being creative in solving environmental problems and interacting with them. 9. Creating a generation that is aware and able to interact with the dangers of environmental pollution, food shortages, global warming and other global problems of concern to humanity. 10. Creating a conscious generation capable of distinguishing between Algae and others.
Indicative Contents المحتويات الإرشادية	1. Knowledge and distinction of scientific terms related to Phycology. 2. Introducing the economic importance of Algae. 3. Introducing the importance of Algaeas environmental markers. 4. Introducing the medicinal importance of the Algae. 5. The importance of the Algae in solving the problems of food shortage in the world. 6. The importance of algae as alternative sources of energy production 7. The correct use of scientific devices and equipment in the Algae laboratory.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	One of the most important strategies that help the student to understand

	Phycology is linking Phycology with other sciences such as ecology, biotechnology and medical sciences, as well as making scientific field trips and collecting plant samples directly from the environment in which you live, as well as contributing to social and cultural activities such as Campaigns to remove pollution from rivers and cities.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to plant groups

Week 2	Cyanobacteria (Blue-green algae) Part I
Week 3	Cyanobacteria (Blue-green algae) Part II
Week 4	Chlorophyta (Green algae)
Week 5	Euglenophyta
Week 6	Bacillariophyta (Diatoms)
Week 7	Exam
Week 8	Xanthophyta (Yellow-green Algae)
Week 9	Dinoflagellate
Week 10	Charophyta
Week 11	Pheophyta (Brown algae)
Week 12	Radophyta (Red algae)
Week 13	Pheophyta (Brown algae)
Week 14	Colourless algae
Week 15	Economic importance of algae
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Laboratory safety and security guidelines
Week 2	Instructions for the use of scientific equipment
Week 3	Types of microscopes and the correct ways to use them
Week 4	Classification of Cyanobacteria (Blue-green algae) Part I
Week 5	Classification of Cyanobacteria (Blue-green algae) Part II
Week 6	Classification of Chlorophyta (Green algae) Part I
Week 7	Classification of Chlorophyta (Green algae) Part II
Week 8	Classification of Euglenophyta
Week9	Classification of Bacillariophyta (Diatoms)
Week10	Classification of Xanthophyta (Yellow-green Algae)
Week11	Classification of Dinoflagellate
Week12	Classification of Pheophyta (Brown algae)
Week13	Classification of Charophyta

Week14	Classification ofPheophyta (Brown algae)
Week 15	Classification of Radophyta (Red algae)
Week 16	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Charles D. Amsler PLANTS, ALGAE, AND FUNGI: Algal Chemical Ecology, • Laura Barsanti and Paolo Gualtieri Algae Anatomy, Biochemistry, and Biotechnology	Yes
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	PARASITOLOGY	**Module Delivery**	
Module Type	CORE	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601045		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	2	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Dr. Raad Abbas Kadhim	**e-mail**	wsci.raad.a@uobabylon.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	Dr.	**e-mail**	
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	16. This course introduces of Human parasitology, an important part of parasitology. 17. To study the medical parasites including their morphology, life cycle, the relationship with host and environment. 18. Training the student to know the diagnosis of parasites and distinguish between them. 19. The objectives are to study the way or the measurement of parasitic diseases control.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	11. Skillfully diagnose the types of parasites. 12. Develop plans and mechanisms to control parasitic diseases and prevent their spread. 13. How to safely deal with parasites. 14. Contribute to prescribing treatment to eliminate pathogenic parasites.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Wear laboratory gloves and a vest when handling parasitoids. 2- Dealing professionally with laboratory equipment such as a microscope and others. 3- Dealing with caution with chemicals such as parasite dyes and fixatives. 4- Using sterile and disinfectant materials after completing the laboratory. 5- Not eating food and drinks during the laboratory. 6- Clean the microscopes and cover them after examination.		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	The main strategy to be adopted in the delivery of this course is to encourage students to participate in exercises and to improve and expand their critical thinking skills at the same time. This will be achieved through classes, interactive educational programs, practical application, field visits to hospitals and medical laboratories, and by conducting practical experiments that include taking samples in which the parasite can exist from humans and the environment, such as blood, feces, water and soil.		

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to parasitology / parasite types and host types / and the relationship of the parasite host immunity / life cycles
Week 2	Protozoa(subphylum Sarcodina and class Lobosea: The amebas: *Entamoebahistolytica Entamoebahartmanni; Entamoeba coli;*Entamoebagingivalis*; Naegleriafowleri*)
Week 3	Flagellate (*Giardia lamblia*; *Chilomastixmesnili; Dientamoebafragilis; Trichomonashominis; Enteromonashominis; Retortamonasintestinalis; Trichomonastenax; Trichomonasvaginalis*)
Week 4	TheHemoflagellates(*Leishmania*spp. and *Trypanosoma* spp.)Cilites (*Balantidium coli*)
Week 5	Sporozoa (*Plasmodium vivax; P. ovale; P. malariae; P. falciparum; Toxoplasma gondii; Isospora belli ; Sarcocystis species ; Cryptosporidium parvum*)
Week 6	Platyhelminthes(Trematoda: *Fasciolopsisbuski*; *Fasciola hepatica; Clonorchissinensis; Heterophyesheterophyes; Metagonimusyokogawai*; *Paragonimuswestermani*)
Week 7	**Exam**
Week 8	Blood trematodes (*Schistosomamansoni; S. japonicum;S. haematobium*)

Week 9	The Cestodes(*Taeniasaginata*;*Taeniasolium*; *Hymenolepisdiminuta; Hymenolepis nana*)
Week 10	*Dipylidiumcaninum; Diphyllobothriumlatum; Echinococcusgranulosus*
Week 11	The Nematodes(*Enterobiusvermicularis, Trichuristrichiura)*
Week 12	*Ascarislumbricoides; Necatoramericanus ;Ancylostomaduodenale*
Week 13	*Strongyloidesstercoralis ; Trichinellaspiralis ;Dracunculusmedinensis*
Week 14	The Filaria (*Wuchereriabancrofti ; Brugiamalayi ;Loa loa ; Onchocerca volvulus ; Mansonellaozzardi*)
Week 15	Discussion the home work.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introducing the student to laboratory recommendations and instructions.
Week 2	Lab 2: How to prepare different laboratory samples, dye them, and then examine them.
Week 3	Lab 3: Microscopic examination of glass slides for parasites of the amoebae group.
Week 4	Lab 4: Microscopic examination of glass slides of parasites of the intestinal and reproductive flagellate group.
Week 5	Lab 5: Microscopic examination of glass slides for parasites of the hematoflagellate group(*Leishmania*spp. and *Trypanosoma* spp.).
Week 6	Lab 6: Microscopic examination of glass slides for *Toxoplasma gondii* and other Sporozoa parasites.
Week 7	Lab 7: Microscopic examination of glass slides for malaria parasites.
Week 8	Lab 8: Microscopic examination of glass slides of flatworm parasites, the flukes group.
Week 9	Lab 9: Microscopic examination of glass slides of worm parasites, a group of tapeworms*(Taeniasaginata*;*Taeniasolium*; *Hymenolepisdiminuta; Hymenolepis nana).*
Week 10	Lab 10: Microscopic examination of glass slides of worm parasites, a group of tapeworms*(Dipylidiumcaninum; Diphyllobothriumlatum; Echinococcusgranulosus*)
Week 11	Lab 11: Microscopic examination of glass slides for intestinal Nematodes parasites.
Week 12	Lab 12: Microscopic examination of glass slides for tissue Nematodes parasites.
Week 13	Lab 13:Mid exam

Week 14	Lab 14:Discussion of reports and seminars, part one
Week 15	Lab 15: Discussion of reports and seminars, part two
Week 16	Final exam.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- FGockel-Blessing, E. A.(2013). Clinical Parasitology: A practical approach. Second Edition: Saunders, an imprint of Elsevier Inc.	Yes
Recommended Texts	2- John, D. T. and Petri, Jr. W. A. (2006). Markell and Voge's Medical parasitology, 9th ed: Saunders Company, USA. 463 pp. 3- Gillespie, H. S. and Pearson, R. D.(2001). Principles and practice of clinical parasitology. John Wiley and Sons Ltd.England.670pp	Yes
Websites	https://www.	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Sciences for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	ANIMAL HISTOLOGY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601053				
ECTS Credits	8				
SWL (hr/sem)					
Module Level	3		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Manar Mohamad Hasan &Dr.RafahHadi		**e-mail**	Manarbio2@gmail.com hadirafah@yahoo.com	
Module Leader's Acad. Title	Professor \ Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**	1.0	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	20. Understand the body tissues 21. Understand types of tissues 22. Understand glands and its histology 23. Understand the stages of tissue histology processing that could explain the microscopic events behind diseases and treatments
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Histology can help students gain a better understanding of cell behavior and reproduction, making cellular biology more understandable Student could be professional in tissue processing , as it is important technique that needed in clinical laboratories
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. *Classificationof Connective Tissues: Definition, Origin, Components, Types and Functions**(4hr)** *Cartilage and bone**(4hr)** *Lymphatic system**(2hr)** ***Tonsils(2hr)** *Female reproductive system**(4hr)** *Uterus and menstrual cycle**(2hr)** *Muscle tissue**(2hr)** * Epithelial tissue Types, importance , glands, types ,classification ,mechanisims of secretion[4 h] *circulatory system :anatomy, histology [4h] *nervous tissue and nervous system: anatomy, classification[6h] *entugumentarysystem[4 h] *male reproductive system[4 h]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the laboratory

	histological teqniques, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Classification of Connective Tissues: Definition, Origin, Components, Types and Functions
Week 2	Cartilage and bone
Week 3	Lymphatic system
Week 4	Tonsils
Week 5	Female reproductive system

Week 6	Uterus and menstrual cycle
Week 7	**Exam**
Week 8	Muscle tissue
Week 9	Epithelial tissue
Week 10	Glands
Week 11	Circulatory system
Week 12	Nervous tissue
Week 13	Nervous system
Week 14	Integumentary system
Week 15	Male reproductive system
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Connective Tissues
Week 2	Lab 2: Cartilage and bone
Week 3	Lab 3: Lymphatic system
Week 4	Lab 4: Female reproductive system
Week 5	Lab 5: Muscle tissue
Week 6	Lab 6: Circulatory system
Week 7	Lab 7: Nervous system
Week 8	Integumentary system

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Histology: a text and atlas with cell and molecular biology.	Yes

Recommended Texts	Netter's Essential Histology: (Netter Basic Science) by William K. Ovalle, Patrick C. Nahirney Anthony Mescher Junqueira's Basic Histology	Yes
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	VIROLOGY	**Module Delivery**	
Module Type	CORE	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601082		
ECTS Credits	8		
SWL (hr/sem)	200		

Module Level	4	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Dr. Zainab A. Tolaifeh	**e-mail**	Zainab.tolaifeh@uobabylon.edu.iq
Module Leader's Acad. Title	Assist.Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	24. Enhance understanding of basic and advanced principles of virology. 25. Providing students with the necessary tools for viral diagnosis, prevention and control. 26. Strengthening students' abilities to predict viral diseases based on the nature of viruses and their role in disease development. 27. Develop students' ability to assess the epidemiology and evolution of the virus. 28. Preparing students with strong leadership and ethical skills, the ability to work within a team, make decisions and communicate with each other, and who are qualified to work with high quality in order to manage viral diseases. 29. Enable students to integrate and evaluate information and data from different sources. 30. Strengthening students' knowledge and skills in conducting scientific research and scientific publications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	15. Build an understanding of virology, its concepts and scope. 16. Identifying health problems and diseases in virology and proposing innovative solutions. 17. Evaluate and improve laboratory equipment and methods for viral diagnosis, as well as data collection methods. 18. Analyze the experimental results, and determine their strength and applicability. 19. Predicting viral diseases by using published scientific research data collection methods and viral genome sequencing. 20. Use scientific literature effectively, prepare presentation and write technical reports. 21. Working on communicating the ideas and information concluded in scientific research to the masses in various fields in an easy and smooth way, even to the masses with different scientific backgrounds.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following:** **Theoretical Part:** 1. Introduction to Virology: An overview of viruses, their structure, classification, and replication strategies.(11 hr) 2. An oncovirus or oncogenic virus: virus that can cause cancer, Causality , Oncogenic viral mechanism. (2hr) 3. Bacteriophage: Definition, Characteristics of bacteriophages, Life cycles

	of bacteriophages, Role in laboratory research, Phage therapy. (2hr) **Practical Part:** 1. Viral Culturing Techniques: Hands-on experience with culturing viruses in appropriate cell lines or host organisms, including viral isolation, propagation, and maintenance. (3hr) 2. Viral Identification and Characterization: Techniques for identifying and characterizing viruses, such as serological assays, nucleic acid-based methods (e.g., PCR, RT-PCR), and genome sequencing. (3hr) 3. Viral Quantification: Methods for quantifying viral load or titer, including plaque assays, quantitative PCR (qPCR), and viral particle counting. (3hr) 4. Immunological Techniques: Introduction to immunological methods used in virology, such as enzyme-linked immunosorbent assay (ELISA), immunofluorescence, and Western blotting. (3hr) 5. Diagnostic Virology: Practical application of diagnostic techniques for viral infections, including sample collection, preparation, and analysis using molecular and immunological methods. (3hr)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/Sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/Sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/Sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to virology
Week 2	Replication of Viruses
Week 3	Classification, Nomenclature of Viruses
Week 4	Antiviral therapy, Vaccines
Week 5	Baltimore Classification, Baltimore group I:ds DNA viruses
Week 6	Baltimore group II: ss DNA viruses
Week 7	**Exam**
Week 8	Baltimore group III: ds RNA viruses
Week 9	Baltimore group IV: Positive sense ss RNAviruses
Week 10	Baltimore group V: Negative sense ss RNA viruses
Week 11	Baltimore group VI: Positive sense ss RNA reverse transcriptaseviruses
Week 12	Baltimore group VII:ds DNA reverse transcriptase viruses
Week 13	Immunity to viruses
Week 14	Bacteriophage (Bacterial viruses)
Week 15	Oncoviruses
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1: Biosecurity and biosafety in virology: Understanding biosafety levels, personal protective equipment (PPE), and laboratory protocols.
Week 2	Lab 2: Quality control and quality assurance in virology laboratories.
Week 3	Lab3: Basic virology techniques: Sample collection, preparation, and storage. Introduction to cell culture and viral growth requirements.
Week 4	Lab4: Viral isolation: Techniques for isolating viruses from clinical samples or environmental sources. Culturing and propagation of viruses in appropriate host cells.
Week 5	Lab5: Viral identification: Serological methods, including enzyme-linked immunosorbent assay (ELISA).
Week 6	Lab6: Immunofluorescence assays (direct &indirect immunofluorescence assays)
Week 7	Lab 7: Virus-host interactions: Study of viral replication cycles, host immune response, and viral pathogenesis. Immunological techniques: Introduction to neutralization assays or Western blotting for viral antigen detection.
Week **8**	Lab 8: Diagnostic virology: Introduction to diagnostic tests for viral infections, such as rapid antigen tests or molecular diagnostics.
Week **9**	Lab 9:Introduction to nucleic acid-based identification techniques, such as PCR or sequencing.
Week **10**	Lab 10: Viral quantification: Methods for determining viral titer and concentration, including plaque assays or quantitative PCR (qPCR).
Week **11**	Lab 11: Antiviral drugs and therapies: Introduction to antiviral agents, their mechanisms of action, and drug resistance. Drug susceptibility testing: Determination of viral sensitivity to antiviral drugs.
Week **12**	Lab 12: Inoculation of chicken embryo for cultivation of animal viruses.
Week **13**	Lab 13: Plaque test: test for bacteriophages.
Week **14**	**Preparatory Week**
Week **15**	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Harvey, R. A., Cornelissen, C. N., Fisher, B. D. (2013). Micro biology. United Kingdom: Lippincott Williams & Wilkins.	**Yes**
Recommended Texts	Encyclopedia of Virology. (2021). Germany: Elsevier Science. Skalka, A. M., Rall, G. F., Flint, S. J., Racaniello, V. R. (2015). Principles of Virology. United States: Wiley.	**No**
Websites	https://viralzone.expasy.org/	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research - Iraq
University of Babylon
College of science for women
Department of biology

Hematology course description
وصف مقرر علم الدم

Module Information معلومات المادة الدراسية					
Module Title	HEMATOLOGY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code					
ECTS Credits	1				
SWL (hr/sem)					
Module Level			**Semester of Delivery**		
Administering Department			**College**		
Module Leader	Dr. Shaymaa Obiad Abdullah		**e-mail**	wsci.shaimaa.obaid@uobabylon.edu.iq	
Module Leader's Acad. Title	Assis. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**		

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	31. Definition of hematology and its importance in the study of blood tissue 32. Giving an idea of the stages of blood formation and its life cycle 33. Clarifying the components of blood tissue 34. Detailing the different functions carried out by blood cells 35. The roles played by the blood tissue through the transfer of heat and food 36. The function that blood tissue performs by connecting all parts of the body 37. Statement of the function of hemoglobin in the blood
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- understanding and knowledge (red and white blood cells , blood cells osmosis ,identify for anemia , blood indicators and blood tests). 2-the subject skills (learn methods of drawing blood , blood types , detection of anemia and work complete blood film . 3-Clarify the functions of blood cells and the length of their survival. And knowledge of the mechanism of breaking down red blood cells and their contents. 4- Show the defensive function performed by the blood tissue. 5- Clarifying the process of blood clotting in all respects. 6- Showing some disorders that arise in the blood tissue.
Indicative Contents المحتويات الإرشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Giving a lecture with the organized involvement of students in the discussion. 2- Using modern presentation methods to simplify models and topics that need broad science fiction. 3- Programming practical experiments in a way that makes them as consistent as possible with theoretical concepts.

Student Workload (SWL)

الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	The concept of hematology in general - blood functions in general - stages of blood formation in the organism's body - bone marrow and a cycle in the formation of blood cells
Week 2	The process of forming red blood cells - controlling the formation of red blood cells - the nutrients needed to form red blood cells The role of hormones in the formation of red blood cells
Week 3	Hemoglobin - stages of hemoglobin manufacturing - control of hemoglobin formation - its functions - types present in the blood during life stages - hemoglobin breakdown products
Week 4	Factors affecting the binding of oxygen to hemoglobin - curve of oxygen separation from hemoglobin - the difference between muscle globin and hemoglobin
Week 5	Red blood cell membrane - anaerobic metabolism red blood cell - the role of antioxidant factors in corpuscles - causes of erythrocyte breakdown - sites of erythrocyte breakdown - erythrocyte breakdown products
Week 6	Antigens on the surface of the red blood cell - their physiological role and structure - blood groups - blood transfusion

Week 7	Compacted cell size - Erythrocyte indices - Normal limits Erythrocyte - its role in determining anemia
Week 8	The concept of anemia - abnormal red blood cell parameters - the most important tests needed to investigate anemia and its causes
Week 9	The role of the element iron in blood function - and quality in nature - the mechanism of absorption from the intestine - the necessary amounts of iron taken daily - the factors that lead to an increase or decrease in iron from the intestine
Week 10	The most important iron storage compounds - the effects of increasing the concentration of iron in the body - the factors that lead to the loss of iron from the body - the necessary tests to investigate the level of iron in the body
Week 11	The concept of blood coagulation - stages of platelet formation - platelet formation - control of platelet formation - physiological role of granules inside platelets
Week 12	The role of platelets in blood clotting - the stages of temporary and permanent thrombus formation - clotting factors in the blood - their structure and physiological role - the stages of thrombosis - blood clotting within the blood vessels and its most important causes - anticoagulants - bleeding and the most important causes
Week 13	White blood cells - Types of white blood cells, their stages of formation - The most important morphological characteristics of white blood cells - Functions of white blood cells according to their types - The most important factors that cause a disorder in the numbers of natural white blood cells
Week 14	Plasma - structure - its functions - lymph, structure and functions
Week 15	some disorders in red blood cells and hemoglobin such as pernicious anemia - hemolytic anemia - hemoglobin abnormalities - deficiency of some enzymes necessary for red blood cell metabolism
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Preparing a blood smear
Week 2	red blood cell count
Week 3	white blood cell count
Week 4	platelet count
Week 5	differential white blood cell count
Week 6	blood groups and rhesus factor
Week 7	Erythrocyte sedimentation rate
Week 8	anemia

Week 9	Packed cell volume (PCV)
Week 10	Estimation of hemoglobin in blood
Week 11	Red blood cell shapes in different types of anemia.
Week 12	Measurement of blood sugar
Week 13	Basic Principles of Hematology
Week 14	Combos Test and blood transfusion
Week 15	exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Clandbennet,J.andPlun ,F,1996.Cecil TText book of Medicine .20th .ed. WB.Saundercomp .philadelphia	Yes
Recommended Texts	Dacie and Lewis , S.M.(2000) Practical hematology .3rd .Philadelphia ,Tokyo.	No
Websites	https://www.amazon.com/Hematology/b?ie=UTF8&node=68974101 1	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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Fail Group	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded

(0 – 49)	**F –** Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**INDUSTRIAL AND FOOD MICROBIOLOGY**			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601083				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		4	**Semester of Delivery**		8
Administering Department		Biology	**College**	College of Science for women	
Module Leader	Prof. Dr. AbeerFauzi Murad		**e-mail**	Wsci.abeer.f@uobabylon.edu.qi	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Prof. Dr. AbeerFauzi Murad		**e-mail**	Wsci.abeer.f@uobabylon.edu.qi	
Peer Reviewer Name			**e-mail**		
Review Committee Approval		01/06/2023	**Version Number**		1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Microbiology	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The module "Industrial and Food Microbiology" aims to provide students with a comprehensive understanding of the role of microorganisms in industrial processes and food production. The module covers various aspects of microbiology related to industrial applications and the food industry, focusing on both theoretical knowledge and practical skills. Food Microbiology: The module delves into the microbiology of food, including the sources of microorganisms in food, factors influencing microbial growth in food, and the role of microorganisms in food spoilage and foodborne illnesses. Students learn about food safety regulations and methods used for food preservation and microbial control. Microorganisms in Industrial Processes: This section explores the applications of microorganisms in various industrial processes, such as fermentation, bioremediation, biofuels production, and pharmaceutical manufacturing. Students gain an understanding of the role of microorganisms in these processes and the techniques used to optimize their performance.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the module on Industrial and Food Microbiology, students can expect to achieve the following learning outcomes: Food Microbiology Outcomes: 1. Food Safety and Quality: Food microbiology focuses on understanding and controlling microbial hazards in food products. The outcomes include the prevention of foodborne illnesses, the implementation of proper food safety practices, and the maintenance of food quality throughout the supply chain. 2. Food Preservation and Shelf Life Extension: Knowledge gained from food microbiology helps develop effective preservation methods to extend the shelf life of perishable food products. This includes techniques such as refrigeration, freezing, canning, drying, and the use of preservatives. 3. Development of Fermented Foods: Food microbiology contributes to the production of fermented foods and beverages such as yogurt, cheese, sauerkraut, and beer. Microorganisms play a vital role in the fermentation process, improving taste, texture, and nutritional value. 4. Microbiological Analysis and Testing: Food microbiology provides analytical methods for detecting and quantifying microorganisms in food samples. These techniques help in monitoring and verifying the microbial quality and safety of food products. 5. Compliance with Food Regulations: Food microbiology assists in meeting food safety regulations and standards set by regulatory authorities. It ensures that food products are safe for consumption and comply with microbiological criteria. Industrial Microbiology Outcomes: 1. Improved Production Processes: Industrial microbiology helps optimize and improve the production processes in various industries by harnessing the power of

	microorganisms. This leads to increased yields, cost-effectiveness, and sustainability. 2. Development of Biotechnological Products: Industrial microbiology plays a crucial role in the development and production of biotechnological products such as enzymes, biofuels, pharmaceuticals, and organic acids. These products have numerous applications in medicine, agriculture, energy, and environmental sectors. 3. Bioremediation and Waste Treatment: Microorganisms are utilized in bioremediation processes to clean up polluted environments and degrade various contaminants. Industrial microbiology contributes to the development of effective waste treatment strategies for industrial and municipal wastes. 4. Quality Control and Assurance: Microbiological techniques and methodologies are employed to ensure the quality and safety of industrial products. This includes monitoring microbial contaminants, implementing quality control measures, and adhering to regulatory standards. 5. Advancements in Genetic Engineering: Industrial microbiology has led to advancements in genetic engineering techniques, allowing the modification and optimization of microorganisms for specific industrial applications.
Indicative Contents المحتويات الإرشادية	**Food Microbiology:** 1. Introduction to Food Microbiology (3hr) 2. Microbial ecology and spoilage of food products (3hr) 3. Foodborne pathogens and foodborne illnesses (4hr) 4. Microbial growth in food and factors affecting microbial growth (3hr) 5. Food preservation techniques (thermal, chemical, and physical methods) (3hr) 6. Fermentation and microbial transformation in food production (3hr) 7. Microbial quality control and food safety regulations (4hr) 8. Microbiological analysis and detection methods in food testing (3hr) 9. HACCP (Hazard Analysis and Critical Control Points) in food industry (3hr) 10. Foodborne outbreaks and food recalls (3hr) **Industrial Microbiology:** 1. Introduction to Industrial Microbiology (3hr) 2. Microbial growth kinetics and measurement (3hr) 3. Microbial metabolism and fermentation processes (4hr) 4. Production of industrial enzymes and biofuels (3hr) 5. Microbial production of antibiotics and pharmaceuticals (3hr) 6. Microbial production of organic acids and solvents (3hr) 7. Microbial production of food additives and flavors (3hr) 8. Bioremediation and waste treatment processes (3hr) 9. Microbial biotechnology and genetic engineering (4hr) 10. Quality control and monitoring in industrial processes (3hr).
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials

	and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	86	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	64	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction to Food Microbiology** Definition and scope of food microbiology Importance of microorganisms in food andHistorical developments in food microbiology
Week 2	**Microbial Foodborne Illnesses** Introduction to foodborne illnesses and their impact on public health Major foodborne pathogens and their characteristics Sources of microbial contamination in food
Week 3	**Microbial Spoilage and Preservation-1** Factors affecting food spoilage Types of spoilage microorganisms
Week 4	**Microbial Spoilage and Preservation-2** Factors affecting food spoilage Types of spoilage microorganisms
Week 5	**Food Preservation Methods** Food packaging and its impact on microbial growth Novel technologies for food preservation Heat treatment (pasteurization, canning) Refrigeration and freezing Drying and dehydration Chemical preservatives Fermentation and acidification

Week 6	**Microbial Food Quality and Safety** Microbial indicators of food quality Foodborne pathogens and toxins Hazard Analysis and Critical Control Points (HACCP) Food safety regulations and standards Emerging issues in food microbiology
Week 7	First exam
Week 8	**Introduction to Industrial Microbiology** Definition and scope of industrial microbiology Historical developments and contributions to industrial processes Importance of microorganisms in industrial applications
Week 9	**Microbial Physiology and Metabolism** Microbial growth requirements and environmental factors Metabolic pathways and regulation in microorganisms Microbial interactions and community dynamics
Week 10	**Fermentation Processes** Principles of fermentation and types of fermenters Microbial kinetics and optimization of fermentation conditions Scale-up and industrial fermentation process design
Week 11	**Microorganisms in industrial processes** Production of enzymes, antibiotics, and other bioactive compounds amino acids, and organic acids Microbial production of food additives and flavors
Week 12	**Microbial Production of Industrial Products**

	Bioplastics and bio-based materials Industrial production of biofuels and biogas Microbial control in industrial settings
Week 13	**Bioremediation and Waste Management** Microbial degradation of pollutants and remediation of contaminated environments Biodegradation of industrial waste and wastewater treatment Application of microbial consortia for waste management
Week 14	**Emerging Trends in Food and Industrial Microbiology** Nanotechnology in food microbiology Genetically modified microorganisms Probiotics and prebiotics Microbiome analysis and its implications Future challenges and opportunities in the field
Week 15	Second exam
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Laboratory Safety and Basic Techniques:** Introduction to laboratory safety protocols and guidelines Proper handling and disposal of hazardous materials Aseptic techniques for handling microorganisms Use and maintenance of laboratory equipment
Week 2	**1. Isolation and Characterization of Microorganisms** • Isolation of microorganisms from environmental samples or food samples using various selective and differential media
Week 3	• **Characterization of isolated microorganisms**

	• through Gram staining, biochemical tests, and microscopy
Week 4	**Food Spoilage Analysis** Examination of food samples for signs of spoilage caused by microorganisms Isolation and identification of spoilage microorganisms responsible for food deterioration
Week 5	**1. Microbial Enumeration in Food Samples** • Total plate count to determine the total viable microbial count in food samples • Enumeration of specific microorganisms (e.g., coliforms, yeast, molds) using selective media
Week 6	**Foodborne Pathogens:** Isolation and identification of foodborne pathogens (e.g., Salmonella, E. coli, Psedomonas Detection methods for foodborne pathogens (e.g., PCR, immunoassays) Study of the factors influencing the growth and survival of foodborne pathogens
Week 7	First Exam
Week8	**Microbial Culturing Techniques**: Aseptic techniques for handling microorganisms Isolation and maintenance of pure cultures Techniques for microbial preservation and storage
Week9	**Microbial Physiology and Metabolism:** Study of microbial growth requirements Nutritional requirements of microorganisms Metabolic pathways and their regulation
Week10	**Fermentation Technology:1** Principles of industrial fermentation Microbial production of metabolites (e.g., ethanol, organic acids, enzymes) Optimization of fermentation conditions (e.g., pH, temperature, substrate concentration)
Week11	**Fermentation Technology:2** Principles of industrial fermentation Microbial production of metabolites (e.g., ethanol, organic acids, enzymes) Optimization of fermentation conditions (e.g., pH, temperature, substrate concentration)
Week12	**Downstream Processing:** Recovery and purification of microbial products Separation techniques (e.g., filtration, centrifugation, chromatography) Formulation and packaging of microbial products
Week13	**Industrial Applications of Microorganisms:** Microbial production of antibiotics and pharmaceuticals Microbial biodegradation and bioremediation Microbial production in the food and beverage industry
Week14	Second Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Industrial Microbiology (2020) David B. Wilson, Hermann Sahm, Klaus-Peter Stahmann, MattheosKoffas** Food Microbiology: Fundamentals and Frontiers(2019)Michael P. Doyle (Editor), Francisco Diez-Gonzalez (Editor), Colin Hill (Editor) 5th Edition	online
Recommended Texts		No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

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ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	CLASSIFICATION OF MICROBIOLOGY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601044				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Oruba Kuttof Hussein		**e-mail**	Wsci.arouna.k@uobabylon.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Dr. Tasahil Hamid		**e-mail**		
Review Committee Approval	10/06/2023		**Version Number**		

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	38. Identifying the basic factors involved in nutrition microorganisms for the purpose of laboratory development and identifying their characteristics and pathogenicity. 39. Identify methods of counting microorganisms for the purpose of evaluating the efficiency of some treatments such as antibiotics 40. Learning the basics of immunity against microbial attack 41. Learning the basics of microbial genetics
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	22. The development of student skills in the field of microorganism cultivation from different samples 23. Identifying the stages of bacterial growth and the characteristics of each stage that allow the student to use some physical or chemical treatments to maintain the survival of the microbe within a certain growth stage without change as a means used in future laboratory experiments 24. introductionto the basics of immunology and genetics of microorganisms supports the student with the basics of the body's defense against microbial infections and the method of gene expression to achieve that immune defense
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – microbial cultivation</u> A-1: Basic materials required for the growth of microbes in the laboratory Calculating microbial growth by direct and indirect methods . [15 hrs] A-2:. Identifying the cultivation conditions and the effect of some nutrition levels of water , Oxygen, Carbon, Nitrogen, PH and temperature.[10 hrs] A-3:. introduction to the microbial physiology and identifying the microbial energy and carbon sources [15 hrs] A-4:microbial genetics and types of mutation and modification [15 hrs] Revision problem classes [6 hrs]

	Part B - Fundamentals B-1:Introduction to the immune defense against microbial infection. [10 hrs] B-2:Approaches to Taxonomy :Numerical Approach and Phylogenetic Approach. [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the laboratory work, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7

assessment	**Final Exam**	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to the Microbial taxonomy
Week 2	Microbial nutrition
Week 3	Energy sources
Week 4	Microbial growth
Week 5	Calculating of microbial growth
Week 6	Microbial physiology
Week 7	Mid-term Exam
Week 8	Metabolic processes in Chemoorganotrophs
Week 9	Aerobic respiration
Week 10	Anaerobic respiration and fermintation
Week 11	Introduction to the immunology
Week 12	Types of immune responses
Week 13	Microbial genetics
Week 14	Types of Mutation and genetic recombination
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: types of microscopes used in microbial examination
Week 2	Lab 2: types of culture media for growing the microbe
Week 3	Lab 3: methods of the microbial culturing
Week 4	Lab 4: types of staining used for identifying the shape and characteristic of microbial

	cells
Week 5	Lab 5: types of dilutions used in microbial experiments
Week 6	Lab 6: isolation of staphylococcus aureus
Week 7	Mid exam
Week 8	Lab 7: isolation of Escherichia coli
Week 9	Types of immunological tests
Week 10	Acid fast stain components and principle of working
Week 11	Tissue culture and its using in viral cultivation
Week 12	Types of Culture media for fungal isolation
Week 13	Antibiotic susceptibility test (disk diffusion method)
Week 14	Preparatory week
Week 15	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamental and structure of microbiology Abed Alnabi Jaweid and Oruba Al-Bermani. (2015)	Yes
Recommended Texts	Jawetz, Melnick, and Adelberg's. (2019). Medical Microbiology. Twenty-Eighth Edition	No
Websites	http://vidyamandira.ac.in/pdfs/e_learning/ds_microbio/MICROBIAL%20TAXONOMY%20MCBA%20P1%20T.pdf	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors

	C - Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for women Department of biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	PATHOGENIC BACTERIA			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601072				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. OrubaKuttof Hussein		**e-mail**	Wsci.arouba.k@uobabylon.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Prof. Ali Malik Saad		**e-mail**		
Review Committee Approval	10/06/2023		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	42. to shed light on bacterial pathogens that are in an increase in the occurrence of various infections 43. Study of the interrelated factors related to the pathogen as well as the host in order to cause the disease 44. Learn the skills of detecting bacterial infections by laboratory methods 45. identification of rare bacterial infections that require advanced genetic methods for the purpose of detection		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	25. Identify the relationships between the microbe and the host 26. Learning about Koch's postulates in identifying the pathogen that causes the disease 27. Identifying bacterial species that cause known and rare infections in human societies 28. Examination of bacterial virulence factors involved in causing infection for each bacterial genus 29. Learning about the laboratory tests for each bacterial infection and the type of clinical sample		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A –</u> A-1: microb- host relationship Learning the definition of parasitism and mutualism and normal flora . [10 hrs] A-2:Main virulence factors and types of bacterial toxins and enzymes. [10 hrs] A-3:Main Pathogenic bacteria genus and species of Gram positive involved in infections. [15 hrs] A-4: main pathogenic bacteria genus and species of Gram negative involved in infections . [15 hrs]		

	Revision problem classes [6 hrs] Part B – laboratoey diagnosis Learning about skill for working the main tests of diagnosis bacterial infection [15 hrs] Identification of main Iraqi bacterial infections and the control ways for these diseases . [4 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the knowledge of a new bacterial diseases and laboratory assay , while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7

	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction to bacterial pathogenesis and microbe-host relationship**
Week 2	**Infection process : adherence, colonization , invasiveness, disease occurrence**
Week 3	**staphylococci**
Week 4	**streptococci**
Week 5	**Gram positive spore – forming bacteria –Bacillus**
Week 6	**Clostridium**
Week 7	**Mid-term Exam**
Week 8	**Corynebacterium**
Week 9	**Mycobacterium**
Week 10	**Enterobacteriacae**
Week 11	**Neisseriae: Neisseriagonorrhoeae**
Week 12	**Neissseria meningitides**
Week 13	**Pseudomonas**
Week 14	**Miscellaneous of uncommon bacteria**
Week 15	**New technique for bacterial infections**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction for main culture media used in isolation and identification of bacteria

Week 2	Lab 2: staphylococci isolation and type of specimens for isolation
Week 3	Lab 3: streptococci isolation and type of specimens for isolation
Week 4	Lab 4: Gram positive rod spore forming bacteria and preparation culture media for isolation
Week 5	Lab 5: introduction for diagnosis of enterobacteriacae species
Week 6	Lab 6 : introduction for the diagnosis of Salmonella spp. involved in typhoid fever
Week 7	Mid exam
Week 8	Elek test explanation for diagnosis toxogenicstrain of corynebacterium
Week 9	Introduction for indole test
Week 10	Introduction for methyl red test
Week 11	Voges -proskauertest
Week 12	Simmoncitrate test
Week 13	Motility test
Week 14	: introduction for the main immunological tests for diagnosis bacterial infections
Week 15	Final exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Jawetz, Melnick, and Adelberg's. (2019). Medical Microbiology. Twenty-Eighth Edition	Yes
Recommended Texts	Chapter 1. Bacteria: Pathogenicity factors SAFETY ASSESSMENT OF TRANSGENIC ORGANISMS: OECD CONSENSUS DOCUMENTS, VOLUME 5 © OECD 2016	No
Websites	Pathogens and Disease , 79, 2021, ftab052 https://doi.org/10.1093/femspd/ftab052	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	البايولوجي الجزيئي MOLECULAR BIOLOGY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601071				
ECTS Credits	8				
SWL (hr/sem)					
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Ali Hussein Al-Marzoqi Dr. Sama JawadAlzuwaini		**e-mail**	almarzoqiali80@gmail.com samajawad540@gmail.com	
Module Leader's Acad. Title	Professor Lecture		**Module Leader's Qualification**	Ph.D. Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Dr. Ali Hussein		**e-mail**	almarzoqiali80@gmail.com	

	Al-Marzoqi Dr. Sama JawadAlzuwaini		samajawad540@gmail.com
Review Committee Approval	01/06/2023	**Version Number**	1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. Introduction to molecular biology: a brief history and its relationship to other sciences. 2. Prokaryotic and eukaryotic cells. 3. The chemical basis of nucleic acids, the structure of DNA and RNA. 4. Components of nucleic acids and their morphological origin. 5. Types of genes: structural and functional, prokaryotic genomes. 6. Replication andtranscription of the genetic material (DNA). 7. Cancers.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe the chemical basis of nucleic acids: the structure of DNA and RNAOrganization of DNA and chromosome components in prokaryotes and eukaryotes 2. Recognize between prokaryotic and eukaryotic DNA and recognize between replication and transcription. 3. Discuss the mutations and their repair 4. Describe the RNA construction: mRNA, rRNA and tRNA 5. Identify the proteins: their types and structure, the structure of proteins associated with nucleic acids 6. Discuss the synthesis of proteins: the translation of RNA stages in prokaryotes and eukaryotes 7. Define molecular biology of chromosomes: the molecular structure		

	of chromosomes 8. Describe the gene: the concept of the gene, the anatomy of the gene, the regulation of protein synthesis 9. Define an operon: its structure and function 10. Explain gene expression in prokaryotes and eukaryotes: reproduction and its regulation
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • The chemical basis of nucleic acids: the structure of DNA and RNA • Regulation of DNA and chromosome components in prokaryotes and eukaryotes • Comparison of DNA in prokaryotes and eukaryotes [15hrs] • Replication: DNA replication, replication steps in prokaryotes and eukaryotes • Mutations and their repair • transcription: transcription of RNA in all its stages in prokaryotes and eukaryotes[15 hrs] • Building the RNA: mRNA, rRNA and tRNA • Proteins: their types and structure, the structure of proteins associated with nucleic acids • Synthesis of proteins: the translation of RNA stages in prokaryotes and eukaryotes[15 hrs] • Molecular biology of chromosomes: the molecular structure of chromosomes • Gene: the concept of the gene, the anatomy of the gene, the regulation of the manufacture of proteins • Operan: its structure and function[15 hrs] • Gene expression in prokaryotes and eukaryotes: reproduction and its regulation • Genes and gene cloning: the elongation and termination of the DNA chain • Synthetic genes[15 hrs] • Revision problem classes [6 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	

Strategies	The primary strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some enjoyable sampling activities for the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Introduction - The chemical basis of nucleic acids: the structure of DNA and RNA
Week 2	• Regulation of DNA and chromosome components in prokaryotes and eukaryotes
Week 3	• Comparison of DNA in prokaryotes and eukaryotes
Week 4	• Replication: DNA replication, replication steps in prokaryotes and eukaryotes

	• Mutations and their repair
Week 5	• transcription: Reproduction of RNA in all its stages in prokaryotes and eukaryotes • Building the RNA: mRNA, rRNA and tRNA
Week 6	• Proteins: their types and structure, the structure of proteins associated with nucleic acids • Synthesis of proteins: the translation of RNA stages in prokaryotes and eukaryotes
Week 7	• **Exam**
Week 8	• Molecular biology of chromosomes: the molecular structure of chromosomes • Gene: the concept of the gene, the anatomy of the gene, the regulation of the manufacture of proteins • Operan: its structure and function
Week 9	• Gene expression in prokaryotes and eukaryotes: reproduction and its regulation • Genes and gene cloning: the elongation and termination of the DNA chainSynthetic genes • The chemical basis of heredity
Week 10	• The structural system of genetic material in cells • Duplication of genetic material: the origin and characteristics of DNA Cloning of genetic material: RNA is its types and characteristics
Week 11	• Translate genetic information and manufacture proteins and genetic code • Genetic mutations and mutagens and the mechanism of repairing genetic defects
Week 12	• Plasmids: types and composition • Transmission of plasmids, the sex determination of bacteria
Week 13	• Transmission of genetic material in bacteria / conjugation process • Transmission of genetic material in bacteria, the process of delivery
Week 14	• Regulation of gene action • Chromosomal maps
Week 15	• Control of gene expression in prokaryotes and eukaryotes • Modern gene expression and analyses
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: biosafety cabinet BSC
Week 2	Lab 2: DNAextrection
Week 3	Lab 3: RNA extraction
Week 4	Lab 4: NA concentration
Week 5	Lab 5: gel electrophoresis

Week 6	Lab 6: PCR
Week 7	Lab 7: **Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• JOCELYN E. KREBS, ELLIOTT S. GOLDSTEIN, STEPHEN T. KILPATRICK. Lewin's GENES XI, Library of Congress Cataloging-in-Publication Data. 2014. • Lewis. Cell and Molecular Biology. Human Genetics: Concepts and Applications. 9th Edition. McGraw-Hill. 2009. • Robert F. Weaver. Molecular Biology. Fifth Edition. 2008. • David P. Clark Nanette J. Pazdernik. Biotechnology: Applying the Genetic Revolution. British Library Cataloguing in Publication Data. 2009. • Stephen R. Bolsover, Jeremy S. Hyams, Elizabeth A. Shephard, Hugh A. White, Claudia G. Wiedemann. CELL BIOLOGY: A Short Course. SECOND EDITION. A JOHN WILEY & SONS, INC., PUBLICATION. 2004. • EberhardPassarge. Color Atlas of Genetics. 2nd edition. Library of Congress Cataloging-in-Publication Data. 2006 • Desmond S. T. Nicholl. An Introduction to Genetic Engineering. Second edition. Cambridge University. 2002 • Jack J. Pasternak. AN INTRODUCTION TO Human Molecular Genetics Mechanisms of Inherited Diseases. Second Edition. A JOHN WILEY & SONS, INC., PUBLICATION. 2002. • Nanette J. Pazdernik, David P. Clark. Molecular Biology. Second Edition. Academic Press is an imprint of Elsevier. 2013. • Michael M. Cox. Jennifer A. Doudna, Michael	Yes

	O'Donnell. Molecular Biology: Principles and Practice. Publisher: Kate Ahr Parke. 2012.	
Recommended Texts	MOLECULAR BIOLOGY, FIFTH EDITION (Book)	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**FUNGAL TAXONOMY**			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601073				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Kawther M. A. Hassan		**e-mail**	Kawther.m@uobaghdad.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**	None	
Review Committee Approval			**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Mycology is a branch of biology concerned with the systematic study of fungi, including those morphological, microscopic, genetic, biochemical and behavioral characteristics, classification, and human uses of them as a source of medicine, food, psychotropic substances, alcohol industry and even religious purposes, as well as assessing their danger to humans, animals, plants and other organisms. Living, such as poisoning and infection of humans and animals and in the field of plant diseases, the study of plant diseases and their causes and even their effects on non-living materials such as destroying buildings and oil derivatives and destroying the rest of organic materials and producing medical drugs and using some of them as fertilizers and in disease control.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Mycology is one of the environmentally important sciences, since these organisms interfere with man and the aspects of his life. Therefore, it is necessary to know everything related to fungi in order for the researcher to make the most of these organisms as well as avoid their harms.
Indicative Contents المحتويات الإرشادية	Classification in fungi has a double objective. First, to give names to fungi that distinguish one from the other, according to established, well-known and universally accepted scientific rules, with the least possible confusion. Secondly, increasing our knowledge about fungi, as well as determining the relationship of fungi to each other, as well as their relationship to living organisms. For this reason, taxonomic levels for fungi were developed to divide fungi into small groups that are easy to study. The advantage of these taxonomic levels is that they have a standard ending, which is a group of letters placed at the end of the level Classification to distinguish it from other levels

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in presenting this unit is to provide students with rich information about fungi, as these organisms are an essential part of the process of recycling nutrients in nature. This will be achieved through educational laboratories and hands-on experiments and by thinking about the type of simple experiments that include some sampling activities that

	are of interest to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Fungal Taxonomical Terminology**
Week 2	**Fungal species concepts**
Week 3	**History of fungi**
Week 4	**Naming of fungi**
Week 5	**The principle of priority**
Week 6	**Taxonomic criteria**
Week 7	**Mid-term Exam**
Week 8	**Microscopic Taxonomic criteria**
Week 9	**Condiogenesis**

Week 10	**Classification of fungi historically**
Week 11	**Molecular identification of fungi**
Week 12	**Polymerase chain reaction (PCR)**
Week 13	**The most important molecular techniques used in the diagnosis of fungi**
Week 14	**Comprehensive review**
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:**Identification of Microfungi**
Week 2	Lab 2: **colony characters**
Week 3	Lab 3: **Spores characters**
Week 4	Lab 4: **Types of conidia**
Week 5	Lab 5: **Identification of Yeasts**
Week 6	Lab 6: **Mid-term Exam**
Week 7	Lab 7: **Classification of fungi**
Week 8	Lab 8: **Kingdom Eumycota---- Division Chytridiomycota**
Week 9	Lab 9: **DivisionZygomycota**
Week 10	Lab 10: **DivisionAscomycota---- Class Hemiascomycetes**
Week 11	Lab 11: **ClassPlectomycetes ----- ClassPyrenomycetes**
Week 12	Lab 12:**Class Discomycetes**
Week 13	Lab 13: **Class Loculoascomycetes**
Week 14	Lab 14:**DivisionBasidiomycota**
Week 15	Lab 15:**DivisionDeuteromycota**
Week 16	Lab 16:**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	**Refai, M.; Heidy, A.E.; and Mahmoud , E. (2013).** Monograph on dermatophytes. Department of Microbiology, Faculty of Veterinary Medicine, Cairo University. 75 pp.	Yes
Recommended Texts	**Pitt, J. I. and Hocking, A. D., 2009.** Fungi and food spoilage. Springer.	Yes
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**MYCOLOGY**	**Module Delivery**	
Module Type	CORE	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601064		
ECTS Credits	8		
SWL (hr/sem)	200		

Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Dr. Kawther M. A. Hassan	**e-mail**	Kawther.m@uobaghdad.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	None
Review Committee Approval		**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	

Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The course describes fungi as important living organisms in the environment. The course deals with everything related to these organisms, including their methods of reproduction, nutrition, shapes, importance and harm to humans, animals and plants. The most important thing is the classification of these organisms and their location in relation to other organisms.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Mycology is one of the environmentally important sciences, since these organisms interfere with man and the aspects of his life. Therefore, it is necessary to know everything related to fungi in order for the researcher to make the most of these organisms as well as avoid their harms.
Indicative Contents المحتويات الإرشادية	Mycology is the science that deals with the study of the composition, classification and methods of reproduction of different types of fungi and their economic importance. The science of mycology has been advancing since the beginning of the current century, thanks to the expansion of scientific research methods, as studies in this science branched out and its horizons expanded greatly, until it became impossible for a single scientist to know all its people, and from here specialization began, so the science of mycology was divided into a number of main branches to Almost every branch of it becomes a future science in itself, like the rest of the other sciences. The most important of these branches are: fungal ecology, fungal physiology, fungal geneties, industrial mycology, medical mycology, and other branches. This knowledge that you find every day.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in presenting this unit is to provide students with rich information about fungi, as these organisms are an essential part of the process of recycling nutrients in nature. This will be achieved through educational laboratories and hands-on experiments and by thinking about the type of simple experiments that include some sampling activities that are of interest to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem)	102	**Structured SWL (h/w)**	7

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction of Mycology**
Week 2	**Growth of fungi**
Week 3	**Modification of mycelia**
Week 4	**Reproduction of fungi**
Week 5	**Importance of fungi**
Week 6	**Classification of fungi**
Week 7	**Mid-term Exam**
Week 8	**Kingdom No. 1- Protista**
Week 9	**Kingdom No. 2-Chromista (Stramenopila)**
Week 10	**Kingdom No. 3-Eumycota** **Division 1- Chytrodiomycota**
Week 11	**Division 2- Zygomycota**
Week 12	**Division 3- Ascomycetes**
Week 13	**Division 4- Basidiomycetes**

Week 14	**Division 5- Deutromycota**
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: **Culture media**
Week 2	Lab 2: **Sterilization and Disinfection**
Week 3	Lab 3: **Isolation of fungifrom soil**
Week 4	Lab 4: **Isolation of fungifrom air**
Week 5	Lab 5: **Isolation of plant fungi**
Week 6	Lab 6: **Loading and staining of fungal samples**
Week 7	Lab 7: **Prepare slides from fungal cultures**
Week 8	Lab 8: **Methods for measuring the growth rate of fungi**
Week 9	Lab 9: **Study of growth by dry weight method**
Week 10	Lab 10:**The effect of temperature on the growth of fungi**
Week 11	Lab 11:**Kingdom: Protista---Division: Plasmodiophoromycota**
Week 12	Lab 12:**Kingdom: Protista---Division: Myxomycota**
Week 13	Lab 13: **Kingdom: Chromista--- Division: Oomycota**
Week 14	Lab 14: **Division: Oomycota**----- **OrderSaprolegniales**
Week 15	Lab 15: **Division: Oomycota**------ **OrderPeronosporales**
Week 16	**Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Refai, M.; Heidy, A.E.; and Mahmoud , E.**	Yes

	(2013). Monograph on dermatophytes. Department of Microbiology, Faculty of Veterinary Medicine, Cairo University. 75 pp.	
Recommended Texts	**Pitt, J. I. and Hocking, A. D., 2009.** Fungi and food spoilage. Springer.	Yes
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Sciences for women	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	ENVIRONMENTAL POLLUTION			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601062				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	3		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Nadia Mahmoud Tawfiq		**e-mail**	Nadia.tawfiq@uobabylon.edu.iq	
Module Leader's Acad. Title	Asist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval	01/06/2023		**Version Number**	1.0	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	After completing this course, students should be able to: 1. The course will provide students with an understanding and appreciation of thecomplex interactions of man, health, and the environment. It will expose studentsto the multi-disciplinary nature of environmental health sciences; the informationand tools required to assess environmental quality as it relates to human andecosystem health. The negative impacts of environmental degradation can have onhuman, wildlife and other bioreceptors in aquatic and terrestrial ecosystems; andthe control measures required to minimize, manage and/or eliminate specificenvironmental problems. 2. The course will address environmental stressors and pollution, their sources inthe natural and workplace environments, their modes of transport andtransformation, their ecological and public health effects, and existing methodsfor environmental disease prevention and remediation. 3. Apply field and practical applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	30. Have gained awareness of current forms of environmental pollution and an overview of both their causes and consequences to natural, economic and social systems. 31. Have gained an understanding of the fundamental principles governing the interactions between those systems (i.e. transport of pollutants in the environment), 32. Have been exposed to learning examples of good practice of technologies and options used to remediate reduce/eliminate pollution of the environment, 33. Be able to analyse, synthesise, and evaluate evidence to understand problems and accordingly select control measures and techniques concerning atmospheric, water or terrestrial challenges.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Circuit Theory

	DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining. resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis . [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilisation, voltage reference, power supplies. [15 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	An overview of the course, expectations, and objectives. Understanding Humans are massively changing the Earth Why does pollution happen?

	Global pollution and global environmental health Our actions have consequences
Week 2	Air Pollution Criteria air pollutants Air Quality Management System Hazardous air pollutants
Week 3	Global Climate Change A warming Earth Significant Elements of Our Changing Climate Greenhouse gases and their sources
Week 4	Global Climate Change Assessing global climate change Industry and government action to reduce emissions
Week 5	Ozone Depletion Consequences of ozone depletion Ozone-depleting pollutants Reducing atmospheric levels of ozone-depleting substances
Week 6	Water Pollution Conventional and Priority Pollutants Impacts of Pollution on Water Bodies Basic Concepts of Eutrophication
Week 7	Soil pollution: chemical sources, effects and solutions
Week 8	Noise and light pollution
Week 9	Thermos pollution
Week 10	Water and Wastewater Treatment Drinking water standards Drinking Water Treatment Process Reducing Point and Non-Point Sources (Treating Wastewater)
Week 11	Solid and Hazardous Waste The Fate of Disposed Municipal Solid Waste Managing Hazardous Waste
Week 12	Sustainable development goals
Week 13	Energy and Mining Energy Resources and Environmental Impacts Emerging Energy Resources and Technologies Environmental Impacts of Mining
Week 14	Reports
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Aquatic environment, water environment tests, pH
Week 2	Lab 2: Measurement of dissolved oxygen in water BOD and COD examination
Week 3	Lab 3: Electrical Conductivity measurement
Week 4	Lab 4: Hardness of water
Week 5	Lab 5Water turbidity and methods of its measurement
Week 6	Lab 6: Basal and methods of measurement
Week 7	Lab 7: Air pollution / global warming
Week 8	Lab 8:Smog: Smog = Fog + Smoke (Smog)
Week 9	Lab 9:Acid rain
Week 10	Lab 10:Air pollution measurement experiment
Week 11	Lab 11:Soil contamination/soil moisture
Week12	Lab 12:Soil salinity
Week13	Lab13:Soil salinity, types and texture
Week14	Lab 14:Reports
Week15	Lab 15:Preparatory Week

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Understanding Global Warming Dire Predictions" Mann, E.M. & L.R. Kump (2008), Pearson Education Canada "Environmental degradation and the tyranny of small decisions" :Odum, W.E., 1982, BioScience 32, 728-729. "The human impact on the natural environment": Andrew Goudie, Blackwells, 388 pp. "Planet under stress": Constance Mungall and Digby McLaren (eds.) For the Royal Society of Canada, Oxford University Press, 344 pp.	Yes
Recommended Texts	"Environmental Science": William Cunningham and Barbara Saigo, Wm. C. Brown Publishers, 622 pp. "Geosystems": Robert Christopherson, Macmillan, 616 pp. "Global Environmental issues": Kevin Pickering and Lewis	No

	Owen, Routledge, 389 pp. "Environment": Peter Raven, Linda Berg and George Johnson, Saunders College Publishing, 567 pp. "Environmental Science", Sixth Edition, Enger, E.D., and B.F. Smith, McGraw-Hill. Chemistry, 4th Edition by Julia Burdge, 2017,McGraw Hill	
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	PLANT ANATMY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601032				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		2	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	

Module Leader	Dr. Huda Jasim Altameme	**e-mail**	Wsci.huda.j@uobabylon.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	08/06/2023	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Understand the internal structure of the plant at the cell level and the organs that make up the plant body. 2- Understand how the plant body is formed by the tissues generated (or meristem) or structural in the roots, stem and theories that explain it. 3- Understand the process of secondary thickening that occurs in plants, which requires knowledge of the exact composition of the vascular and corky cambium that process the thickening. 4- Understand the relationship between environment and histological changes in plant organs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	34. The student should understand the internal structure of the cell and the primary and secondary cell wall. 35. Knowing the contents of the living and non-living plant cell, and the structure and function of all the organelles that spread in the cell. 36. Use a light microscope and a dissection kit to examine plants 37. Distinguish the permanent tissues and the tissue systems to which they belong (connective, primary and vascular) starting from the epidermis, parenchymal, collenchyma, sclerenchyma, wood and phloem tissues in addition to secretory tissues. 38. Identifying the tissues from which plant parts such as the root, stem and leaf are composed. 39. Knowing the tissues that result from the secondary thickening process, such as wood, secondary bark, annual rings, and the

	abnormal growth that occurs to some plants.
Indicative Contents المحتويات الإرشادية	**Instructional content includes the following:** 1- Field scientific visits 2- Forming student groups to conduct practical experiments 3- Experimental education by conducting a practical experiment in laboratories 4- Using modern display methods to simplify models and topics that need wide science fiction, and using video on display screens to clarify scientific films on the subject.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy to be adopted in delivering this unit is to encourage students 1- Microscopic examination using different microscopes to investigate plant cells and compare them with animal cells 2- Modern methods for the direct and indirect detection of microscopic cell components 3- To form an idea of the methods of distinguishing between primary and secondary plant tissues 4- Distinguishing tissues in flowering plants (monocotyledonous and dicotyledonous plants) and some structures of gymnosperm plants. 5- Performing temporary slide preparation techniques and using special pigments in coloring

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Anatomy and Plant Body Organs.
Week 2	Supplement of plant body organs - cell wall
Week 3	Non-living and living contents of the plant cell
Week 4	Meristematic or structural tissues
Week 5	Permanent tissue- Epidermis
Week 6	Parenchyma, Collenchyma, Sclerenchyma tissue
Week 7	Primary Phloem and Xylem
Week 8	Secretory tissue and root.
Week 9	Internal structure of the stem and leaf
Week 10	Secondary thickening, vascular cambium,
Week 11	Secondary wood
Week 12	Secondary phloem, Periderm
Week 13	Secondary thickening of the stems and roots
Week 14	Modification in Drought and aquatic plants,
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Stages of cell wall formation - primary wall - secondary wall - interstitial spaces,

	their types and method of formation.
Week 2	Lab 2: Plant cell - living components (types of plastids)
Week 3	Lab 3: Plant cell - non-living components.
Week 4	Lab 4: Cell wall - clicks and their types.
Week 5	Lab 5: Meristematic tissue. The developing apex in the roots and theories of growth and division in the root, the developing apex in the stem and theories of growth and division in the stem.
Week 6	Lab 6: Lateral meristems - vascular cambium - its components. Cork cambium - surrounding epidermis.
Week 7	Lab 7: Persistent tissue - parenchymal tissue - its types - forms of cells in it.
Week 8	Lab 8: Collenchyma tissue - its types.
Week 9	Lab 9: Sclerenchyma tissue - types of cells in it - sclereids and their types - fibers and their types.
Week 10	Lab 10: Xylem, its components in gymnosperms and angiosperms and in the longitudinal and diagonal axis.
Week 11	Lab 11: Annual rings - types of wood (diffuse pores - annular pores - non-perforated wood)
Week 12	Lab 12: Phloem tissue - its components in gymnosperms and angiosperms - primary phloem - secondary phloem.
Week 13	Lab 13: Internal anatomy of the stem and root in both cotyledon and monocotyledon.
Week 14	Lab 14: Types of central cylinder.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	العاني، بدري عويد وقيصر نجيل (١٩٨٨). أساسيات علم تشريح النبات. وزارة التعليم العالي والبحث العلمي ، جامعة بغداد ، العراق .	Yes
Recommended Texts	An Introduction to Plant Structure and Development, Plant Anatomy for the Twenty-First Century Second Edition (1975) Charles B. Beck https://doi.org/10.1017/CBO9780511844683	yes
Websites	https://education.tiu.edu.iq/biology//wp-content/uploads/2019/11/Plant-Anatomy2nd-grade....pdf	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	PLANT TAXONOMY			**Module Delivery**	
Module Type	CORE			**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601042				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		2	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Dr. Huda Jasim Altameme		**e-mail**	Wsci.huda.j@uobabylon.edu.iq	

Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	08/06/2023	**Version Number**	1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	The student should be able to: 5- Understand the historical development of plant taxonomy 6- Describe, define and understand the basics of taxonomy. 7- Identify taxonomic systems and the basics of development. 8- Knowledge of the phenotypic structure of the vascular plants and the variations that phenotypic characteristics can exhibit. 9- Understand the process of pollination and its types and the means that help in the process of pollination and the relationship of vaccination to evolution.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	40. Identify the formal variation in floral and fruit compositions of higher plants growing around us, and then how to classify these plants in similar groups using the degree of similarity and variation in the development of taxonomic systems to distinguish between plants and distinguish. 41. Details of variance in higher plants based on the difference in the shape and composition of flowers, inflorescences and fruits. 42. Identify the different classification methods and apply some of these methods to different wild and cultivated plant groups. 43. Identify the many plants that surround it and their relationships with each other. 44. How to build a key to diagnose plants at the family level? 45. How to spread plants and mechanisms that help it? 46. Identify the general characteristics of a group of plant families belonging to single or two cotyledons		
Indicative Contents المحتويات الإرشادية	**Instructional content includes the following:** 5- Field scientific visits 6- Forming student groups to conduct practical experiments		

	7- Field research with the subject professor to identify some wild plants and collect them for the herbarium 8- Using modern display methods to simplify models and topics that need wide science fiction, and using video on display screens to clarify scientific films on the subject.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy to be adopted in delivering this unit is to encourage students 6- The student acquires a great knowledge about the plants that grow around him, how to differentiate between them and get him used to arranging them in similar groups. 7- Know the principles used in writing a description of a plant. 8- Knowing how plants are named and why plant names change. 9- How to use references in taxonomy. 10- The interaction of the student with the scientific material, which is represented in his cooperation in providing plant samples, enables him to understand the differences between plants.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to the importance of taxonomy in our daily lives and the objectives of taxonomy
Week 2	The relationship of taxonomy to other sciences - the history of taxonomy
Week 3	General terms -Root and Stem
Week 4	Leaf
Week 5	Supplemented by the leaf, the Bract
Week 6	Reproductive organs - Flower
Week 7	Calyx - Coralla
Week 8	Androecium and Gynoecium
Week 9	Inflorescence
Week 10	Fruit
Week 11	Pollination
Week 12	Reproductive systems
Week 13	Scientific names
Week 14	Study of some families of monocotyledons and dicotyledons
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: General instructions for laboratory work in taxonomy, how to collect, dry, compress and use diagnostic keys.
Week 2	Lab 2: Root system and types of stems of flowering plants
Week 3	Lab 3: Leaf - petioles, petioles, types of venation
Week 4	Lab 4: Types of top, base and edge of the leaf, the nature of the surface covering of the leaves.

Week 5	Lab 5: Terminology for reproductive organs - bracts and calyx types
Week 6	Lab 6: Types of petals for flowering plants - the male organ of the plant
Week 7	Lab 7: The feminizing system of the plant - the morphology.
Week 8	Lab 8: Inflorescences and floral systems.
Week 9	Lab 9: The fruit and its types
Week 10	Lab 10: A field trip to collect samples (collecting at least twenty-five plant families)
Week 11	Lab 11: Examples of different families are diagnosed in the laboratory and are studied in detail and according to their availability.
Week 12	Lab 12: Examples of different families are diagnosed in the laboratory and are studied in detail and according to their availability.
Week 13	Lab 13: Examples of different families are diagnosed in the laboratory and are studied in detail and according to their availability.
Week 14	Lab 14: Examples of different families are diagnosed in the laboratory and are studied in detail and according to their availability.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الموسوي، علي حسين (١٩٨٧) علم التصنيف النبات وزارة التعليم العالي والبحث العلمي جامعة بغداد ، العراق.	Yes
Recommended Texts	• Tod F. Stuessy. (2009). Plant Taxonomy .2nd.ed. Columbia university press, New York. • Gurcharan Singh. (2010). Plant Systematics. 3rd.ed. Science Publishers, Enfield, NH, USA	yes
Websites	• https://byjus.com/neet/important-notes-of-biology-for-neet-plant-taxonomy/	

APPENDIX:

GRADING SCHEME
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded

(0 – 49)	**F –** Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	MEDICAL ENTOMOLOGY		**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Practical** **Seminar**	
Module Code				
ECTS Credits				
SWL (hr/sem)				
Module Level	4	**Semester of Delivery**	7	
Administering Department	Type Dept. Code	**College**	Type College Code	

Module Leader	Dr. Ekhlas Al-Shareefi	**e-mail**	wsci.ikhlass.m@uobabylon.edu.iq
Module Leader's Acad. Title	Asst. Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor	Asst. Prof. Nebras Mohammed	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**Version Number**	

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	• Fundamentals of Entomology • Classification of Entomology	**Semester**	3 & 4
Co-requisites module	• Parasitology • Invertebrates	**Semester**	3 & 4
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	46. This course will provide the fundamental information necessary for understanding the role of arthropod vectors in the transmission of different pathogens to human and livestock. 47. The course further enhances the knowledge of their breeding biology and control measure. 48. Following a general review of the morphology, life cycle and classification of arthropods, individual groups of medical importance are considered in detail in regard to the recognition of important species, the epidemiology and pathogenesis of associated diseases, and the principles and methods of vector control.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course the participants should be able to: • Understand the basic biology and ecology of the arthropods of public health importance. • Comprehend the surveillance tools and control strategies of		

	important public health vectors • Understand the influence of climate and environment on vector ecology • Enhance the skills in vector-borne disease (VBD) surveillance, insect species identification (Taxonomy) and vector control
Indicative Contents المحتويات الإرشادية	• **Medical entomology** is the study of insects, insect-borne diseases and other associated problems that affect humans and public health. Veterinary entomology is the study of insect-related problems that affect domestic animals, particularly livestock and companion animals (dog, cats, horses, caged birds, etc.). In addition, veterinary entomology includes insect-associated problems affecting captive animals in zoological parks and in wildlife in general. Medical- veterinary entomology combines these two disciplines. • The field of Medical entomology has included health-related problems involving arachnids (particularly mites, ticks, spiders, and scorpions). • Historically, both medical and veterinary entomology have played major roles in the development of human civilization and animal husbandry. Outbreaks of insect-borne diseases of humans have profoundly influenced human history; such diseases include yellow fever, plague, louse-borne typhus, malaria, African trypanosomiasis, Chagas disease, and lymphatic filariasis. Arthropod-related disorders continue to cause significant health problems to humans, domestic animals, and wildlife. • At the same time, new strains of known pathogens, as well as previously unrecognized disease agents transmitted by arthropods, are causing newly recognized diseases (e.g., Lyme disease and human granulocytic anaplasmosis) and the resurgence of diseases that had been suppressed for many years (e.g., malaria, Chikungunya fever, and Zika encephalitis).
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Lecture # 1- General Introduction to Medical Entomology** 1. Classification of Arthropoda and the Medical Importance of Groups of Minor Significance 2. Mouthparts of Insects of Medical Importance and Host Finding 3. Vector-borne diseases 1) Disease transmission a. Mechanical transmission b. Biological transmission 2) Factors influencing transmission
Week 2	**Lecture # 2- Introduction to mosquitoes (Culicidae)** 1. External morphology 2. Life cycle 3. Classification of mosquitoes 4. Medical importance 5. Mosquito control
Week 3	**Lecture # 3- Anopheline mosquitoes (Anophelinae)** 1. External morphology 2. Life cycle 3. Medical importance

	4. Control
Week 4	**Lecture # 4- Culicine mosquitoes (Culicinae)** 1. *Culex* mosquitoes 2. *Aedes* mosquitoes 3. *Haemagogus* mosquitoes 4. Medical importance 5. Control
Week 5	**Lecture # 5- Phlebotomine sand flies (Phlebotominae)** 1. External morphology 2. Life cycle 3. Medical importance 4. Control
Week 6	**Lecture # 6- Horse flies (Tabanidae)** 1. External morphology 2. Life cycle 3. Medical importance 4. Control
Week 7	Mid-term Exam
Week 8	**Lecture # 7 - Tsetse flies (Glossinidae)** 1. External morphology 2. Life cycle 3. Medical importance 4. Control
Week 9	**Lecture # 8- House flies and stable flies (Muscidae) and latrine flies (Fanniidae)** 1. The common house fly (*Musca domestica*) 2. The greater house fly (*Muscina stabulans*) 3. The stable fly (*Stomoxys calcitrans*) 4. The lesser or little house fly and the latrine fly (*Fannia* species)
Week 10	**Lecture # 9 - Flies and myiasis** 1. Types of myiasis 2. Classification 3. Calliphoridae: non-metallic flies 4. Calliphoridae: metallic flies 5. Sarcophagidae: flesh flies 6. Oestridae: bot flies 7. Other myiasis-producing flies
Week 11	**Lecture #10- Fleas (Siphonaptera)** 1. External morphology 2. Life cycle 3. Medical importance *4. Tunga penetrans* 5. Control of fleas
Week 12	**Lecture #11- Sucking lice (Anoplura)** 1. The body louse (*Pediculus humanus*) 2. The head louse (*Pediculus capitis*) 3. The pubic louse (*Pthirus pubis*)
Week 13	**Lecture #12 - Soft ticks (Argasidae) and Hard ticks (Ixodidae)** 1. External morphology

	2. Life cycle 3. Behaviour and habits 4. Medical importance 5. Control
Week 14	**Lecture #13- Scabies mites (Sarcoptidae) and Scrub typhus mites (Trombiculidae)** 1. External morphology 2. Life cycle 3. Ecology 4. Medical importance **5.** Control
Week 15	**Lecture # 14 – Diseases of which the pathogens are transmitted by insects or Acarines** 1. Arboviruses 2. Typhus and Other Reckettsial Disease 3. Relapsing Fever, Plague and Tularaemia 4. Malaria (*Plasmodium*) and other Heamospororina (Sporozoa) 5. Trypanosomiases and Leishmaniases
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab 1: General information** 1. Classification of Arthropoda and the Medical Importance of Groups of Minor Significance 2. Mouthparts of Insects of Medical Importance and Host Finding
Week 2	**Lab 2: Mosquitoes (Culicidae)** 1. Life cycle 2. Classification of mosquitoes 3. Medical importance
Week 3	**Lab 3: Anopheline mosquitoes (Anophelinae)** 1. External morphology 2. Life cycle 3. Medical importance
Week 4	**Lab 4: - Culicine mosquitoes (Culicinae)** 1. *Culex* mosquitoes 2. *Aedes* mosquitoes
Week 5	**Lab 5: Horse flies (Tabanidae)** 1. External morphology 2. Life cycle 3. Medical importance
Week 6	**Lab 6: House flies and stable flies (Muscidae) and latrine flies (Fanniidae)** 1. The common house fly (*Musca domestica*) 2. The greater house fly (*Muscina stabulans*) 3. The stable fly (*Stomoxys calcitrans*) The lesser or little house fly and the latrine fly (*Fannia* species)

Week 7	**Lab 7: Sucking lice (Anoplura)** 1. The body louse (*Pediculus humanus*) 2. The head louse (*Pediculus capitis*)
Week 8	**Lab 8: Tsetse flies (Glossinidae)** 1. External morphology 2. Life cycle
Week 9	**Lab 9: Phlebotomine sand flies (Phlebotominae)** 1. External morphology 2. Life cycle
Week 10	**Lab 10: Flies and myiasis** 1. Types of myiasis 2. Classification 3. Calliphoridae: non-metallic flies 4. Calliphoridae: metallic flies 5. Sarcophagidae: flesh flies 6. Oestridae: bot flies
Week 11	**Lab 11: Soft ticks (Argasidae) and Hard ticks (Ixodidae)** 1. External morphology 2. Life cycle
Week 12	**Lab 12: Scabies mites (Sarcoptidae) and Scrub typhus mites (Trombiculidae)** 1. External morphology 2. Life cycle
Week 13	**Lab 13: Diseases of which the pathogens are transmitted by insects or Acarines** 1. Arboviruses 2. Typhus and Other Reckettsial Disease
Week 14	**Lab 14: General Review for Exam**
Week 15	**Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Service, M., 2012. Medical Entomology for Students. CAMBRIDGE UNIVERSITY PRESS. • Mullen, G.R. and Durden, L.A. eds., 2009. Medical and veterinary entomology. Academic press. • Lane, R.P. and Crosskey, R.W., 2012. Medical insects and arachnids. Springer Science & Business Media.	No

	• McGavin, G.C., 2001. Essential entomology: an order-by-order introduction. Oxford University Press.	
Recommended Texts	• Amendt, J., Campobasso, C.P., Goff, M.L. and Grassberger, M. eds., 2010. Current concepts in forensic entomology (Vol. 376). Springer Science+ Business Media BV. • Harwood, R.F. and James, M.T., 1979. Entomology in human and animal health (No. 7th edition). Macmillan Publishing Co. Inc. New York; Baillière Tindall, 35 Red Lion Square, London WC1R 4SG. • Pedigo, L.P., 1989. Entomology and pest management. Macmillan Publishing Company.	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	CLASSIFICATION OF ENTOMOLOGY		**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Practical** **Seminar**	
Module Code	UOBAB0601041			
ECTS Credits				
SWL (hr/sem)				
Module Level	2	**Semester of Delivery**	4	
Administering Department	Type Dept. Code	**College**	Type College Code	

Module Leader	Dr. Ekhlas Al-Shareefi	**e-mail**	wsci.ikhlass.m@uobabylon.edu.iq
Module Leader's Acad. Title	Asst. Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor	Asst. Prof. Nebras Mohammed	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**Version Number**	

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Fundamentals of Entomology	**Semester**	3
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. Identify the distinguishing characteristics of an insect. 2. Identify the three main sections of an insect. 3. Insect Identification 4. Identify the different life stages of insects. 5. Describe how insects are classified. 6. Identify the distinguishing characteristics of insect orders. Identify the distinguishing characteristics of insect families		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	47. Students are trained in the basics of insect classifications and preservation of collected samples in the laboratory condition for future studies. 48. The behavioral paradigm, insect physiology and biological applications of various insects are studied in detail. 49. Nutritional requirements of different insects are discussed and this will help the students to establish own insect culture at home or fields.		

	50. The training helps the students to apply for different competitive exams and get selected. 51. Taxonomical training in identification and classification of insects helps students get job opportunities as entomologists or in related fields.
Indicative Contents المحتويات الإرشادية	• Systematics may be defined as the study of the kinds and diversity of organisms and the relationships among them. Taxonomy, the theory and practice of identifying, describing, naming, and classifying organisms, is an integral part of systematics. Classification is the arrangement of organisms into groups (*taxa*, singular *taxon*) on the basis of their relationships. • It follows that identification can take place only after a classification has been established. It should be emphasized that not all authors adopt these definitions. Taxonomy is often used as a synonym of systematics (as defined above), while classification is sometimes used rather loosely (and incorrectly) as a synonym of identification. • Approximately three-fourths of a million species of insects have so far been described and named, and their number is being gradually increased from year to year. So far as those competent to judge are able to estimate, it seems probable that this number represents perhaps one-fifth or one-tenth of those which actually exist upon our planet at the present time. Their descriptions fill libraries and their final identification requires the knowledge of specialists. • All animals, including insects, are classified by characteristics that are similar. The animal kingdom is the most general category. It is divided into groups until the insects that are most alike are classified together. Field guides or insect keys are references that usually include the following information: a. Description of the insect b. Distinguishing features of the order c. How different insects are related to one another d. The lifestyle and environment of the insect Field Guides are used because nobody can memorize all the information on insect classification. Currently there are 29 orders of insect's entomologist agree upon.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Lecture # 1- Systematics and Taxonomy** 1. Naming and Describing Insects 2. Classification 1) The History of Insect Classification 3. Identification 1) Key to the Orders of Insects
Week 2	**Lecture # 2- Apterygote Hexapods** 1. Collembola 2. Protura 3. Diplura
Week 3	**Lecture # 3** 1. Microcoryphia 2. Zygentoma
Week 4	**Lecture # 4 - Paleoptera**

	1. Ephemeroptera **2.** Odonata
Week 5	**Lecture # 5 – The Plecopteroid, Blattoid, and Orthopteroid Orders** 1. Plecoptera 2. Embioptera 3. Dictyoptera
Week 6	**Lecture # 6** 1. Isoptera 2. Grylloblattodea 3. Dermaptera
Week 7	Mid-term Exam
Week 8	**Lecture # 8** 1. Phasmida 2. Mantophasmatodea 3. Orthoptera 4. Zoraptera
Week 9	**Lecture # 9– The Hemipteroid Orders** 1. Psocoptera 2. Phthiraptera
Week 10	**Lecture # 10** 1. Hemiptera 2. Thysanoptera
Week 11	**Lecture # 11 – The Panorpoid Orders** 1. Mecoptera 2. Diptera
Week 12	**Lecture # 12** 1. Siphonaptera 2. Trichoptera 3. Lepidoptera
Week 13	**Lecture # 13 – The Remaining Endopterygote Orders** 1. Megaloptera 2. Raphidioptera
Week 14	**Lecture # 14** 1. Neuroptera 2. Coleoptera
Week 15	**Lecture # 15** 1. Strepsiptera 2. Hymenoptera
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to taxonomy; insect collections

Week 2	Lab 2: The insect head and mouthparts
Week 3	Lab 3: Apterygota and primitive pterygote orders
Week 4	Lab 4: Orthopteroid orders.
Week 5	Lab 5: Hemipteroid orders
Week 6	Lab 6: Panorpoid orders; Higher insect orders
Week 7	Lab 7: Neuropteroid orders
Week 8	Lab exam; Completion of insect collections
Week 9	Lab 9: 1- Phasmida 2- Mantophasmatodea 3- Orthoptera 4- Zoraptera
Week 10	Lab 8: The Hemipteroid Orders
Week 11	Lab 10: The Hemipteroid Orders 1. Hemiptera 2. Thysanoptera
Week 12	Lab 11: **The Panorpoid Orders** 1. Mecoptera 2. Diptera
Week 13	Lab 12: **The Remaining Endopterygote Orders** 1. Megaloptera 2. Raphidioptera
Week 14	A reviewing for Exam
Week 15	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Chapman, R., 1990. The insect: structure and function: The English language. *Bristol, UK: Book Society and Hodder and Stoughton, Great Britain*. • Gillott, C., 2005. *Entomology*. Springer Science & Business Media. • Gullan, P.J. and Cranston, P.S., 2014. The insects: an	No

	outline of entomology. John Wiley & Sons.	
Recommended Texts	• Barnard, P.C., 2011. *The royal entomological society book of British insects*. John Wiley & Sons. • Packard, A.S., 1898. *A Text-book of Entomology: Including the Anatomy, Physiology, Embryology and Metamorphoses of Insects, for Use in Agricultural and Technical Schools and Colleges as Well as by the Working Entomologist*. Macmillan.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	FUNDAMENTALS OF ENTOMOLOGY	**Module Delivery**
Module Type	CORE	**Theory** **Lecture** **Lab** **Practical** **Seminar**
Module Code	UOBAB0601031	
ECTS Credits		

SWL (hr/sem)					
Module Level		2	**Semester of Delivery**		3
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Dr. Ekhlas Al-Shareefi		**e-mail**	wsci.ikhlass.m@uobabylon.edu.iq	
Module Leader's Acad. Title		Asst. Prof.	**Module Leader's Qualification**		Ph.D.
Module Tutor	Asst. Prof. Nebras Mohammed		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**		

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	49. Understand the comparative morphology of insect organ systems. 50. Understand how the morphology of an organ is related to its function. 51. To provide the concept of structure and function of various organs and organ systems of insects.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	52. The course will cover study of insect development and physiology of exoskeleton, endoskeleton and different systems; hormones and pheromones. 53. To provide concepts of comparative physiology, their functions and origin in different insect orders and families.		

	54. To provide the basic concept of insect origin in the time dimension. 55. To provide the basic concept of impact of environment on insects, and insects as indices of environmental changes 56. Identify the distinguishing characteristics of an insect. 57. Identify the three main sections of an insect.
Indicative Contents المحتويات الإرشادية	• Entomology is the study of insects and their interactions with their surroundings and other lifeforms. Through studying the Entomology Course, students will learn of the importance of insects, how they are classified, the external and internal structures of their bodies, how they detect stimuli, how they reproduce and grow, their defense mechanisms, how entomologists collect insects, and how we interact with them. • Beginning with an introduction to the subject, the course explains what entomology is and explores its history, and the importance of insects and insect biodiversity. You'll learn how systematic classification works, common types of insects and how to identify insects. • Students will explore the structures of insects - externally and internally. We'll cover the various parts of an insect, some functions of insect body parts and the general framework of an insect. We then discuss the biochemical breakdown, absorption, and excretion process of insects, the internal structures and their functions, and the female and male internal organs of many insects. We'll also look into the ways in which insects detect stimuli and the behaviors that are elicited or changed by environmental stimuli. • The Entomology Course covers the various aspects of the reproductive system of insects, including the reproductive system itself. We also look into embryological development, the patterns of insect growth phases from egg to adult, the different types of metamorphosis and their significance, and the effects genetics and environment have on their development.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Lecture # 1- Arthropod Evolution** 1. Arthropod Diversity 2. Evolutionary Relationships of Arthropods 3. The Uniramians • Myriapoda-Hexapoda Relationships (Arachnida, Crustacea)
Week 2	**Lecture # 2- The Success of Insects** 1. The Adaptability of Insects 2. The Importance of Environmental Changes
Week 3	**Lecture # 3- External Structure** 1. General Body Parts 2. The Head 1) General Structure

	2) Head Appendages a. Antennae b. Mouthparts The Neck and Thorax 1) The Neck 2) Structure of the Thorax 3) Thoracic Appendages a. Legs b. Wings 3. The Abdomen 1) General Structure 2) Abdominal Appendages a. External Genitalia b. Other Appendages
Week 4	**Lecture # 4- Insect Diversity** 1. Primitive Wingless Insects 2. Evolution of Winged Insects 1) Origin and Evolution of Wings 2) Phylogenetic Relationships of the Pterygota 3) Origin and Functions of the Pupa
Week 5	**Lecture # 5- The Integument** 1. Cuticle Formation 1) Preecdysis 2) Ecdysis 3) Postecdysis 4) Coordination of Events 2. Functions of the Integument
Week 6	**Lecture # 6- Sensory Systems** 1. Mechanoreception 1) Sensory Hairs 2) Proprioceptors 3) Signal Detection 2. Sound Reception 1) Johnston's Organ 2) Tympanal Organs 3) Subgenual Organs 3. Photoreception 1) Compound Eyes a. Form and Movement Perception b. Distance Perception c. Spectral Sensitivity and Colour Vision d. Sensitivity to Polarized Light 2) Simple Eyes
Week 7	Mid-term Exam
Week 8	**Lecture # 7- Nervous and Chemical Integration** 1. Nervous System 1) Central Nervous System

	2) Visceral Nervous System 3) Physiology of Neural Integration 4) Learning and Memory
Week 9	**Lecture # 8- Food Uptake and Utilization - 1** 1. Food Selection and Feeding 2. The Alimentary System 1) Salivary Glands 2) Foregut 3) Midgut 4) Hindgut 3. Gut Physiology 1) Gut Movements 2) Digestion 3) Absorption 4. Metabolism 1) Sites of Metabolism 2) Carbohydrate Metabolism 3) Lipid Metabolism 4) Amino Acid and Protein Metabolism
Week 10	**Lecture # 9- Food Uptake and Utilization - 2** 5. Metabolism 5) Sites of Metabolism a. Fat Body b. Mycetocytes 6) Carbohydrate Metabolism 7) Lipid Metabolism Amino Acid and Protein Metabolism
Week 11	**Lecture # 10- The Circulatory System** 1. Structure 2. Physiology 1) Circulation 2) Heartbeat 3. Hemolymph 1) Plasma a. Composition b. Functions 4. Hemocytes 1) Origin, Number, and Form 2) Functions
Week 12	**Lecture # 11-Nitrogenous Excretion and Salt and Water Balance** 1. Excretory Systems 1) Malpighian Tubules—Rectum 2) Other Excretory Structures 2. Nitrogenous Excretion 1) The Nature of Nitrogenous Wastes 2) Physiology of Nitrogenous Excretion 3) Storage Excretion 3. Salt and Water Balance

	1) Terrestrial Insects 2) Freshwater Insects 3) Brackish-Water and Saltwater Insects 4. Hormonal Control
Week 13	**Lecture # 12- Reproduction** 1. Structure and Function of the Reproductive System 1) Female 2) Male 2. Ovulation 3. Oviposition 1) Site Selection 2) Mechanics and Control of Oviposition 3) Oothecae
Week 14	**Lecture # 13- Gas Exchange** 1. Organization and Structure of the Tracheal System 1) Tracheae and Tracheoles 2) Spiracles 2. Movement of Gases within the Tracheal System 1) Diffusion 2) Discontinuous Gas Exchange 1. Active Ventilation
Week 15	**Lecture # 14- Muscles and Locomotion** 2. Muscles 1) Structure 2) Physiology 3. Locomotion 4. Flight 1) Structural Basis 2) Aerodynamic Considerations 3) Mechanics of Wing Movements 4) Control of Wing Movements 5. Orientation
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Methods of collection and preservation of insects including immature stages
Week 2	Lab 2: External features of Grasshopper/Blister beetle
Week 3	Lab 3: Types of insect antennae, mouthparts and legs
Week 4	Lab 4: Types of insect mouthparts
Week 5	Lab 5: Types of insect legs

Week 6	Lab 6: Wing venation, types of wings and wing coupling apparatus.
Week 7	Lab 7: Types of insect larvae and pupae female reproductive systems in insects
Week 8	Lab 8: Dissection of digestive system in insects (Grasshopper)
Week 9	Lab 9: Dissection of male and female reproductive systems in insects (Grasshopper)
Week 10	Lab exam; Completion of insect collections
Week 11	Lab 11 : The Circulatory System
Week 12	Lab 12 : Structure and Function of the Reproductive System
Week 13	Lab 13: Organization and Structure of the Tracheal System 1) Tracheae and Tracheoles 2) Spiracles
Week 14	A reviewing for Exam
Week 15	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Chapman, R., 1990. The insect: structure and function: The English language. *Bristol, UK: Book Society and Hodder and Stoughton, Great Britain*. • Gillott, C., 2005. *Entomology*. Springer Science & Business Media. • Gullan, P.J. and Cranston, P.S., 2014. The insects: an outline of entomology. John Wiley & Sons.	No
Recommended Texts	• Barnard, P.C., 2011. *The royal entomological society book of British insects*. John Wiley & Sons. • Packard, A.S., 1898. *A Text-book of Entomology: Including the Anatomy, Physiology, Embryology and Metamorphoses of Insects, for Use in Agricultural and Technical Schools and Colleges as Well as by the Working Entomologist*. Macmillan.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	FUNDAMENTALS OF ENTOMOLOGY	**Module Delivery**
Module Type	CORE	**Theory** **Lecture** **Lab**
Module Code	UOBAB0601031	

ECTS Credits			**Practical Seminar**		
SWL (hr/sem)					
Module Level	2		**Semester of Delivery**	3	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Ekhlas Al-Shareefi		**e-mail**	wsci.ikhlass.m@uobabylon.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Asst. Prof. Nebras Mohammed		**e-mail**	None	
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**		

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	52. Understand the comparative morphology of insect organ systems. 53. Understand how the morphology of an organ is related to its function. 54. To provide the concept of structure and function of various organs and organ systems of insects.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	58. The course will cover study of insect development and physiology of exoskeleton, endoskeleton and different systems; hormones and pheromones.		

	59. To provide concepts of comparative physiology, their functions and origin in different insect orders and families. 60. To provide the basic concept of insect origin in the time dimension. 61. To provide the basic concept of impact of environment on insects, and insects as indices of environmental changes 62. Identify the distinguishing characteristics of an insect. 63. Identify the three main sections of an insect.
Indicative Contents المحتويات الإرشادية	• Entomology is the study of insects and their interactions with their surroundings and other lifeforms. Through studying the Entomology Course, students will learn of the importance of insects, how they are classified, the external and internal structures of their bodies, how they detect stimuli, how they reproduce and grow, their defense mechanisms, how entomologists collect insects, and how we interact with them. • Beginning with an introduction to the subject, the course explains what entomology is and explores its history, and the importance of insects and insect biodiversity. You'll learn how systematic classification works, common types of insects and how to identify insects. • Students will explore the structures of insects - externally and internally. We'll cover the various parts of an insect, some functions of insect body parts and the general framework of an insect. We then discuss the biochemical breakdown, absorption, and excretion process of insects, the internal structures and their functions, and the female and male internal organs of many insects. We'll also look into the ways in which insects detect stimuli and the behaviors that are elicited or changed by environmental stimuli. • The Entomology Course covers the various aspects of the reproductive system of insects, including the reproductive system itself. We also look into embryological development, the patterns of insect growth phases from egg to adult, the different types of metamorphosis and their significance, and the effects genetics and environment have on their development.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of

	simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Lecture # 1- Arthropod Evolution** 4. Arthropod Diversity 5. Evolutionary Relationships of Arthropods 6. The Uniramians • Myriapoda-Hexapoda Relationships (Arachnida, Crustacea)
Week 2	**Lecture # 2- The Success of Insects** 3. The Adaptability of Insects 4. The Importance of Environmental Changes
Week 3	**Lecture # 3- External Structure** 4. General Body Parts

	5. The Head 3) General Structure 4) Head Appendages c. Antennae d. Mouthparts The Neck and Thorax 4) The Neck 5) Structure of the Thorax 6) Thoracic Appendages c. Legs d. Wings 6. The Abdomen 3) General Structure 4) Abdominal Appendages c. External Genitalia d. Other Appendages
Week 4	**Lecture # 4- Insect Diversity** 3. Primitive Wingless Insects 4. Evolution of Winged Insects 4) Origin and Evolution of Wings 5) Phylogenetic Relationships of the Pterygota 6) Origin and Functions of the Pupa
Week 5	**Lecture # 5- The Integument** 2. Cuticle Formation 5) Preecdysis 6) Ecdysis 7) Postecdysis 8) Coordination of Events 2. Functions of the Integument
Week 6	**Lecture # 6- Sensory Systems** 4. Mechanoreception 4) Sensory Hairs 5) Proprioceptors 6) Signal Detection 5. Sound Reception 4) Johnston's Organ 5) Tympanal Organs 6) Subgenual Organs 6. Photoreception 2) Compound Eyes e. Form and Movement Perception f. Distance Perception g. Spectral Sensitivity and Colour Vision h. Sensitivity to Polarized Light 2) Simple Eyes
Week 7	Mid-term Exam
Week 8	**Lecture # 7- Nervous and Chemical Integration**

	2. Nervous System 5) Central Nervous System 6) Visceral Nervous System 7) Physiology of Neural Integration 8) Learning and Memory
Week 9	**Lecture # 8- Food Uptake and Utilization - 1** 6. Food Selection and Feeding 7. The Alimentary System 5) Salivary Glands 6) Foregut 7) Midgut 8) Hindgut 8. Gut Physiology 3) Gut Movements 4) Digestion 3) Absorption 9. Metabolism 8) Sites of Metabolism 9) Carbohydrate Metabolism 10) Lipid Metabolism 11) Amino Acid and Protein Metabolism
Week 10	**Lecture # 9- Food Uptake and Utilization - 2** 10. Metabolism 12) Sites of Metabolism c. Fat Body d. Mycetocytes 13) Carbohydrate Metabolism 14) Lipid Metabolism Amino Acid and Protein Metabolism
Week 11	**Lecture # 10- The Circulatory System** 5. Structure 6. Physiology 3) Circulation 4) Heartbeat 7. Hemolymph 2) Plasma c. Composition d. Functions 8. Hemocytes 3) Origin, Number, and Form 4) Functions
Week 12	**Lecture # 11-Nitrogenous Excretion and Salt and Water Balance** 4. Excretory Systems 3) Malpighian Tubules—Rectum 4) Other Excretory Structures 5. Nitrogenous Excretion 4) The Nature of Nitrogenous Wastes 5) Physiology of Nitrogenous Excretion

	6) Storage Excretion 6. Salt and Water Balance 4) Terrestrial Insects 5) Freshwater Insects 6) Brackish-Water and Saltwater Insects 4. Hormonal Control
Week 13	**Lecture # 12- Reproduction** 4. Structure and Function of the Reproductive System 3) Female 4) Male 5. Ovulation 6. Oviposition 4) Site Selection 5) Mechanics and Control of Oviposition 6) Oothecae
Week 14	**Lecture # 13- Gas Exchange** 3. Organization and Structure of the Tracheal System 3) Tracheae and Tracheoles 4) Spiracles 4. Movement of Gases within the Tracheal System 3) Diffusion 4) Discontinuous Gas Exchange 6. Active Ventilation
Week 15	**Lecture # 14- Muscles and Locomotion** 7. Muscles 3) Structure 4) Physiology 8. Locomotion 9. Flight 5) Structural Basis 6) Aerodynamic Considerations 7) Mechanics of Wing Movements 8) Control of Wing Movements 10. Orientation
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Methods of collection and preservation of insects including immature stages
Week 2	Lab 2: External features of Grasshopper/Blister beetle
Week 3	Lab 3: Types of insect antennae, mouthparts and legs

Week 4	Lab 4: Types of insect mouthparts
Week 5	Lab 5: Types of insect legs
Week 6	Lab 6: Wing venation, types of wings and wing coupling apparatus.
Week 7	Lab 7: Types of insect larvae and pupae female reproductive systems in insects
Week 8	Lab 8: Dissection of digestive system in insects (Grasshopper)
Week 9	Lab 9: Dissection of male and female reproductive systems in insects (Grasshopper)
Week 10	Lab exam; Completion of insect collections
Week 11	Lab 11 : The Circulatory System
Week 12	Lab 12 : Structure and Function of the Reproductive System
Week 13	Lab 13: Organization and Structure of the Tracheal System 1) Tracheae and Tracheoles 2) Spiracles
Week 14	A reviewing for Exam
Week 15	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Chapman, R., 1990. The insect: structure and function: The English language. *Bristol, UK: Book Society and Hodder and Stoughton, Great Britain*. • Gillott, C., 2005. *Entomology*. Springer Science & Business Media. • Gullan, P.J. and Cranston, P.S., 2014. The insects: an outline of entomology. John Wiley & Sons.	No
Recommended Texts	• Barnard, P.C., 2011. *The royal entomological society book of British insects*. John Wiley & Sons. • Packard, A.S., 1898. *A Text-book of Entomology: Including the Anatomy, Physiology, Embryology and Metamorphoses of Insects, for Use in Agricultural and Technical Schools and Colleges as Well as by the Working Entomologist*. Macmillan.	No
Websites		

	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	PATHOLOGICAL ANALYSIS			
Module Type	CORE		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code				
ECTS Credits	8			
SWL (hr/sem)				
Module Level		**Semester of Delivery**		
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader	Dr. Hawraa Sabah Al-Musawi	**e-mail**	wsci.hawraa.s@uobabylon.edu	
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval		**Version Number**		

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	55. To familiarize the student with diseases and their mechanisms of action against the body and cellular tissue 56. The student should be able to distinguish and classify diseases according to the correct scientific foundations 57. Studying clinical examinations for various diseases 58. Identify the mechanisms and mechanics of conducting the laboratory examination 59. Identify the devices for each test and their practical applications in different fields. 60. Analysis of microorganisms in various clinical samples (blood, urine,

	urine, tissue biopsy, etc.)
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A-Cognitive goals 1. Knowing the art of communicating with individuals and ways of using different means of cooperation in spreading health awareness 2. Learn about public health and health protection from health pollution 3. Knowing the steps to prepare solutions for any health problem and how to form a work team that participates in solving the problem and emphasizing the issue of professional ethics and good dealing with patients. B- Skills objectives of the course: 1. Enable the student to apply the theoretical material to reality. 2. The graduate should be able to think scientifically and logically in professional behavior. 3. To be able to solve problems and think creatively. 4. To be able to work as one team 5 To be able to perform all tests and give the results and describe them scientifically 6 . To be able to handle all laboratory devices and equipment.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Students must wear lab gowns, gloves and masks 2. Handle with care laboratory chemicals 3. Do not use the mobile device inside the laboratory 4. Do not eat food and drinks inside the laboratory 5. Ensure that tools and hands are sterilized before and after work
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	A. Theoretical lectures B. Practical laboratories C. Films and slideshows

	D. Scientific trips for field application

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Pathology specimen
Week 2	Urine analysis 1
Week 3	Urine analysis 2
Week 4	Stool analysis
Week 5	Blood collection
Week 6	Exam
Week 7	Pregnancy test
Week 8	Semen analysis 1
Week 9	Semen analysis 2
Week 10	Blood chemistry tests

Week 11	Liver function test
Week 12	Kidney function test
Week 13	Lipid profile
Week 14	Cerebrospinal fluid test 1
Week 15	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Pathology specimen
Week 2	Urine analysis 1
Week 3	Urine analysis
Week 4	Stool analysis
Week 5	Blood collection
Week 6	Exam
Week 7	Pregnancy test
Week 8	Semen analysis 1
Week 9	Semen analysis 2
Week 10	Blood chemistry tests
Week 11	Liver function test
Week 12	Kidney function test
Week 13	Lipid profile
Week 14	Cerebrospinal fluid test
Week 15	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Current Diagnosis & Treatment in Infectious Diseases (LANGE CURRENT Series) 2nd Edition by Walter Wilson (Author), Merle Sande (Author(2. LABORATORY MEDICINE BASIC SEROLOGICAL TESTING	NO
Recommended Texts		
Websites	- The Internet	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	BIOSAFETYAND BIO SECURITY	**Module Delivery**	
Module Type	CORE	**Theory** **Lecture**	
Module Code	UOBAB0601024		

ECTS Credits	8			
SWL (hr/sem)				
Module Level			**Semester of Delivery**	1
Administering Department	Type Dept. Code		**College**	Type College Code
Module Leader	Assist Prof. Dr. Tsahel Hamid Al.Dulaimi		**e-mail**	dulaimi.dulaimi@uobabylon.edu.iq
Module Leader's Acad. Title	Assist Professor		**Module Leader's Qualification**	Ph.D.
Module Tutor	None		**e-mail**	None
Peer Reviewer Name			**e-mail**	
Review Committee Approval	01/06/2023		**Version Number**	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1) Understanding of hazard management references and familiarity with local biosafety regulations 2) Understanding the medical risk management system and its risk assessment and application of protection and mitigation systems 3) Spreading and consolidating the principles and culture of biological risk management to ensure the health and safety of all. 4) Conducting and publishing scientific research in application of local and international concepts of biosafety and biosecurity 5) Distinguishing between useful and safe applications and realizing the dangerous applications of scientific research. 6) Learn about biological hazards 7) How to deal with biological hazards 8) How to mitigate biological hazards
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1) Demonstrating practical skills: demonstrating skills in how to deal with accidents that occur while working in laboratories 2) Identifying biological risks and infectious diseases and how to control them in laboratories 3) Learn how to use workers in the two fields of work

	4) Risk Exploration and Problem Solving: Identify and troubleshoot common problems that may be encountered while working in the laboratories, develop solutions, and effectively troubleshoot technical issues. 5) Applying ethical considerations: identifying and discussing ethical considerations related to the safety of laboratory workers, such as confronting expected risks during work, biological security, responsible use of available devices and equipment, and emphasizing good ethical relationships among laboratory workers.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. An introduction to safety and security in biological laboratories and work injuries in them: an overview of methods of preventing occupational accidents and identifying the most important behaviors to be followed in laboratories and strategies for their application
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

	Time/Nu	Weight (Marks)	Week Due	Relevant Learning

		mber			Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Occupational Safety and Health and General objectives of the Occupational Safety and Health
Week 2	Biological safety objectives and A brief history the development of biosafety
Week 3	Biological hazards and Control of biological hazards
Week 4	Methods of control biological hazards
Week 5	The right choice for those working in laboratories and Work Permits
Week 6	The most important behaviors of human relations
Week 7	Mid exam
Week 8	Hazardous waste and methods of Treatment and drainage
Week 9	Procedures and methods of trading and dealing with laboratory waste
Week 10	Biosecurity and Principles of Laboratory Biosecurity
Week 11	Risk Management Methodology
Week 12	Elements of a Biosecurity Program
Week 13	Information Security and Countering biorisks
Week 14	Discussion the home work
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	None
Week 2	

Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week8	
Week9	
Week10	
Week11	
Week12	
Week13	
Week14	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Salerno, R.M.,Gaudioso, J., (2015). Laboratory Biorisk Management. Bio-safety and Bio-security. CRC Press	No
Recommended Texts		
Websites	1- World Health Organization (2006), Laboratory Bio-security Manual. WHO Press Geneva 2- World Health Organization (2004), Laboratory Bio-safety Manual. 3ed edition. WHO Press Geneva	

APPENDIX:

GRADING SCHEME
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Sciences for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	ANIMAL PHYSIOLOGY	**Module Delivery**	
Module Type	CORE	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601063		
ECTS Credits	8		
SWL (hr/sem)			
Module Level	3	**Semester of Delivery**	2

Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Prof. Dr. dakhel ghani omran	**e-mail**	Bvc851198@gmail.com
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**Version Number**	1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	61. Understand the functions of body 62. Understand the functions of systems and organs 63. Understand the interactions of different functions of the system 64. Understand the functions of body activities that carried out by laboratory experiments
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Physiology can help students gain a better understanding of body activities and their interactions to produce homeostasis Student could be professional in examination of normal functions of cells , tissues organs and systems ,that help student to perform laboratory examinations of normal and abnormal parameters
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. * basic normal functions of cells , distributions of ions across cell membrane **(4hr)** * electrical events occurring in nervous cells**(4hr)** * excitable tissues**(2hr)** * **nervous system(2hr)** * autonomic nervous system and neurotransmitters**(4hr)** * fundamentals Endocrine system**(2hr)** * Cardiovascular system **(2hr)**

	* digestive system * reproductive system[4 h] * Bones and calcium homeostasis [4h] * Regulation of body temperature [6h] * Basal metabolic rate and regulation of feeding[4 h] *Urinary system and renin – angiotensin system[4 h]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the laboratory examination and measurement of body functions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
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Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to physiology principles and definition of physiology , homeostasis
Week 2	Structure of cells , physiological phenomena such as diffusion , osmotic pressure , intracellular and extracellular fluids , distribution of ions across cell membranes
Week 3	Excitable tissues , nervous tissues , structure of neurons , action potential , neurotransmitters
Week 4	Skeletal of muscles , their structures , contraction and relaxation , white and red muscle , types of contraction
Week 5	Autonomic nervous system and its functions
Week 6	Principles Endocrine system
Week 7	**Exam**
Week 8	Pancreas insulin , adrenal gland ,
Week 9	Thyroid and parathyroid gland ,
Week 10	Hypothalamic – pituitary axis
Week 11	Digestive system
Week 12	Cardiovascular system
Week 13	Regulation of body temperature and basal metabolic rate
Week 14	Female reproductive system
Week 15	Male reproductive system
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Osmotic fragility
Week 2	Lab 2: determination of packed cell volume and cell count
Week 3	Lab 3: measurement of reflexes
Week 4	Lab 4: measurement of heart rate

Week 5	Lab 5: body temperature
Week 6	Lab 6: body mass index
Week 7	Lab 7: blood pressure
Week 8	Pulmonary volumes

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Winder ,E ., P Raff , H. ,and Strag , K. (2004) Human physiology , Ganong of medical physiology	Yes
Recommended Texts	Netter's Essential Histology: (Netter Basic Science) by William K. Ovalle, Patrick C. Nahirney Anthony Mescher Junqueira's Basic Histology Guyton of medical physiology Harpers of Biochemistry	Yes
Websites		

APPENDIX:

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MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**COMPUTER SCIENCE**		**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601025			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level	1	**Semester of Delivery**	1	
Administering Department	Type Dept. Code	**College**	Type College Code	
Module Leader	Assistant Teacher WijdanNoamanMarzoog	**e-mail**	wsci.wijdan.marzoog@uobabylon.edu.iq	

Module Leader's Acad. Title	Assistant Teacher	**Module Leader's Qualification**	Master's
Module Tutor	A.t.	**e-mail**	None
Peer Reviewer Name		**e-mail**	
Review Committee Approval	15/06/2023	**Version Number**	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1- Educating the student to be familiar with the basic rules for dealing with and managing the computer to help him in completing projects, printing matters, preparing statistics and graphs, creating presentations, designing engineering plans, etc., and the emergence of the Internet as a means of communication available to all, it has become very necessary for the student to learn to use the computer, due to the role of the Internet in many fields Including education, scientific research, trade and marketing through electronic correspondence, web pages and electronic communication. 2- Develop Connection and communication skills for students. 3- The ability to use modern software and applications professionally and employ technical aspects to serve the community.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1- Cognitive goals :** 1.1 The student's comprehension of the material 1.2 The ability to analyze and apply what you learn practically on the calculator. 1.3 The evaluation is done by presenting the material to the students in the laboratory and then applied by them **2- Skill objectives of the course:** 2.1 direct questions and answers about the previous article. 2.2 Analyzing the student's ability to absorb through home-work, which is carried out at home and stored on the computer		

	2.3 Tablets to display in front of the students directly to know the extent of what they have learned from the previous lecture 2.4 Show educational films related to the subject in order to consolidate the ability to learn
Indicative Contents المحتويات الإرشادية	The computer laboratory is of great importance and distinctive in providing the student with sufficient information and experience in the field of using electronic devices (computers), which helps students develop their scientific and practical skills in the field of information technology that they need during their educational career. To activate the role of the computer laboratory within the standards of quality assurance, management conditions must be provided. Safety and security, risk assessment in the laboratory for students, and equipment maintenance to reach the desired goal, as follows: 1- Providing the laboratory with the necessary and necessary devices and equipment. 2- Arranging computers in their appropriate places. 3- The power supplied from the current and voltage of the laboratory must be suitable for the power consumed by the computer network in order for the devices to operate with high efficiency. 4-The presence of a main circuit breaker near the entrance to the laboratory so that the laboratory official can cut off the electricity when necessary and as quickly as possible. 5-When connecting computers in the laboratory, it is taken into account that each computer system is linked to a separate electricity supply point. 6 - Provide an electric charger to avoid sudden power outages from the device. 7- The laboratory must be equipped with refrigeration equipment, vacuum cleaners, preventing sunlight from entering the equipment, internal lighting and computer hardware packaging. 8 - It is taken into account that the computer system is placed on a wooden table to prevent electrical connection, and warning and indicative panels must be posted on the walls of the laboratory. 9 - Every student, after completing work in the laboratory, must disconnect the main electrical current to preserve the safety of the laboratory and its equipment.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy to be adopted in delivering this course is to encourage students to participate in exercises and to improve and expand their critical thinking skills at the same time. This will be achieved through classes, interactive tutorials, practical application, and conducting practical experiments that include implementing programs on the computer and how to deal with social sites.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Compare the different types of computers and their purposes.
Week 2	Describe the function of different hardware components such as CPU, storage systems, RAM, ROM etc. and common input and output devices and describe how they work in sequence to process information.
Week 3	Identify and explain the different types of software: operating systems, application software and programming software and explain the terms shareware, freeware, end-user license agreement and the concept of software copyright.
Week 4	Identify the basic knowledge of computer ergonomics (seating, lighting, positioning, ventilation etc.) and explain the common health problems associated with computer usage and ways to avoid them.
Week 5	Identify the Iraq data protection legislation.
Week 6	Explore network fundamentals, types and the benefits and risk of network.
Week 7	**Exam**

Week 8	The requirements of a computer suitable for purchasing for student usage.
Week 9	Clarification of the terms Hertz and byte.
Week 10	How to install and uninstall the program.
Week 11	Illustrate the hierarchical structure of drives, files and folders and identify the meaning of file extension.
Week 12	Use Windows operating system to manage files and folders easily by creating, deleting, and copying, moving, and compressing / decompressing files and using Settings' options.
Week 13	Use web browsers to browse information on the Internet and to manipulate its tools and options.
Week 14	Viruses are the most important steps necessary to protect against penetration, the components of viruses, their types, and their damage to the computer.
Week 15	**Discussion the home work.**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Operating system classification Examples of operating system.
Week 2	Lab 2: Windows 7 operating system.
Week 3	Lab 3: Requirements for installing the operating system and desktop components (use a calculator to find out its components).
Week 4	Lab 4: Start menu and its contents (computer use).
Week 5	Lab 5: New features of Windows 7 (video tutorial).
Week 6	Lab 6: Taskbar (use the computer to see the contents).
Week 7	Lab 7: Defining computer networks, identifying their basic components, explaining the benefits of computer networks, and defining their different classifications (educational video).
Week 8	Lab 8: A practical application about installing and uninstalling programs.
Week 9	Lab 9: Practical application on how to create, copy, move and compress folders (using the computer in the laboratory).
Week 10	Lab 10: Give a brief overview of the concept of the protocol in general and the Internet protocol in particular (educational video).
Week 11	Lab 11: Determine the requirements and methods of Internet connection, and identify the areas of Internet use.
Week 12	Lab 12: Practical application on the dangers of the Internet and methods of prevention and the most prominent contemporary applications in the world of the Internet.
Week 13	Lab 13: A practical application that shows the removal of the virus from the infected computer.
Week 14	Lab 14**:Discuss practical projects**

Week 15	**Exam.**

Learning and Teaching Resources مصادر التعلم والتدريس		
	1- أساسيات الحاسوب وتطبيقاته المكتبية / ٤ أجزاء – أ.د. غسانحميد عبد المجيد و .د. زياد محمد عبود واخرون 2- **Donald H. Sanders, (1995), Computer today, Second edition, McGraw –hill** 3- **Yusr Al-Mustafa Series for Science "Basics of Computer and Internet Office 2010, Dr. Ziyad Muhammad Abboud, Dar Al-Doctor for Publishing and Distribution, Baghdad 2013** 4- **Any other materials available on the web.**	**Available in the Library?**
Required Texts		
Recommended Texts		
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**SOIL AND AQUATIC MICROBIOLOGY**		**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code				
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level			**Semester of Delivery**	
Administering Department			**College**	
Module Leader	Dr. Mahammed E. Al-Defiery		**e-mail**	ubs.md@uobabylon.edu.iq
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.
Module Tutor			**e-mail**	
Peer Reviewer Name			**e-mail**	
Review Committee Approval			**Version Number**	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. Understand basic theoretical and experimental approaches to soil and water microbiology. 2. Identify the components and types of soils and water environments. 3. Studying environmental components and interactions of microorganisms in soil and water. 4. Identify the types of microorganisms in the soil and water environment 5. Describe each type of microorganism such as bacteria, fungi, actinomycetes, algae, protozoa and viruses. 6. Studying the activities of microorganisms in soil and water and their interventions. 7. Determine the biotic and abiotic factors affecting the number, activity, growth and reproduction of microorganisms. 8. Studying geo-chemo cycles, the life of carbon and nitrogen, and the decomposition of organic matter and animal and plant waste. 9. Learn important ecological concepts and information for soil and water microorganisms. 10. Explore how the soil and water microorganisms you learn about in class relate to current natural and environmental phenomena. 11. Studying environmental components and microbial interactions in soil, water and air. 12. Identifying the types of microbes in the soil and water environment. Studying the types of microbes used as microbial indicators of water and food contamination and disease carriers. 13. Studying the types of microbes used as microbial indicators of water and food contamination and disease carriers 14. Studying microbial activities in soil and water.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Soil and water microbiology study the microorganisms that live in soil and water, in addition to knowing the vital functions of microorganisms and their impact on the properties of soil or water. This science also aims to reveal the transformations associated with the activities of these organisms and their mutual results on the one hand and to study their effects on other organisms, as well as their interaction with animals and plants and their relationship to the medium in which they live. It also		

	includes environmental factors affecting bacteria, fungi, actinomycetes, algae, protozoa, viruses and nematodes that reside in soil and water environments. • Description of microorganisms in different environments, environmental factors affecting microbes • Geo and chemo cycles of carbon and nitrogen life • Waterborne diseases, water treatment processes, and water quality standards • Soil environment, microbes in the soil, food chain in the soil, decomposition of organic matter in the soil. • Biology in the soil, bacteria, fungi, actinomycetes, microbial interactions in the soil and microbial activity • Addressing the types of microorganisms in water and soil • Addressing how diseases are transmitted to humans or animals through water and soil • Linking theoretical methods of treatment with field and practical reality • Students understand how to benefit from identifying the types of pathogenic microorganisms • Identify the importance of microbes in the recycling and recycling of various compounds in the environment and the production of useful materials from organic fertilizers, biogas and biofuel.
Indicative Contents المحتويات الإرشادية	Understanding the role and forms of microorganisms and their distribution in soil and water and the factors affecting the types and distribution of microorganisms in soil and water and the environmental conditions in which they live. Knowledge of nitrogen and carbon transformations and their relationship with environmental systems. The transfer of matter and energy and the movement of nutrients in soil and water, in addition to the processes of decomposition and assimilation that occur as a result of biological activities. The most important groups of soil and aquatic microbiology: Bacteria (60 hr) Fungi (yeasts and molds) (40 hr) Actinomyces(25 hr) Algae(25 hr) Protozoa(25 hr) Other organisms (25 hr)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in presenting the study material is

	to teach students to know the types and species of microorganisms in soil and water and to understand their role and functions in the ecosystem while studying the factors affecting microorganisms to improve the intellectual and cognitive structure of students in biological science and expanding it at the same time. This will be achieved through classes and interactive tutorials from theoretical lectures, additional training, assignments, projects, seminars, discussions, and laboratory experiments involving sampling from soil and water and isolating microorganisms from them.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	**Introduction to soil and water microbiology** The emergence and development of soil microbiology- Introduction to Aquatic Microbiology - An introduction to soil microbiology - Classification of soil microorganisms (according to the nature of their existence, energy source, carbon, oxygen, heat)- Factors affecting the growth of soil microorganisms
Week 2	**Soil System A habitat for organism** The definition of soil- Soil Components(Soil microorganisms- Soil texture- Soil Profile- Soil moisture- Soil organic matter
Week 3	**Soil Biology** Introduction to soil revival- The beneficial effects of organisms in the soil- The harmful effects of organisms in the soil- Soil food web- Biological properties of soil- Interrelationships between soil organisms- Soil Animals - Earthworms - Arthropods - Mammals- Soil Biomass
Week 4	**Soil bacteria** The abundance, spread and presence of bacteria- Bacterial genera common in soil- Classification of soil bacteria according to Gram Stain-The biochemical functions of bacteria - Bacteria multiply- Nitrogen fixing bacteria- Factors affecting the growth and multiplication of soil bacteria
Week 5	**Soil Fungi** An introduction to soil fungi- The presence of an abundance of fungi- The installation of fungi- Nutrition in fungi - The proliferation of fungi- The role of fungi in the soil- Root fungi (Mycorrhizae)- Environmental factors affecting soil fungi
Week 6	**Algae Soil and water** An introduction to algae- Distribution and types of soil algae- Algal blooms- The importance of algae in soil and water - Factors affecting the presence of algae in soil and water- Environmental and economic importance- Lichens
Week 7	Mid-term Exam
Week 8	**Actinomycetes** Introduction to Actinomycetes- Characteristics of actinomycetes- The most important genera of actinomycetes- The importance of actinomycetes and their role in soil- Factors affecting the growth and reproduction of soil actinomycetes
Week 9	**Soil Protozoa** Introduction to Soil Protozoa- Characteristics of Protozoa- Protozoa feeding- The importance of protozoa- Factors affecting soil protozoa- Divide the types of protozoa in the soil
Week 10	**Viruses Soil** Introduction to viruses in soil- Virus definition (types and forms of viruses)- The virus multiplied- Bacteriophage multiplication- Lytic bacteriophage and Lysogenic bacteriophag
Week 11	**Soil Nematoda** An introduction to nematodes- Characteristics of nematodes- Classification of nematodes according to their feeding behavior - Living nematodes- Factors affecting the reproduction and activity of nematodes

Week 12	**Aquatic Environment** Introduction to the aquatic environment- Water microbes - Dissolved oxygen and the biological requirement for oxygen – Wastewater- Microbiological characteristics and waterborne diseases
Week 13	**Environmental factors affecting the growth of microorganisms in water** Light- The temperature- Turbidity and adsorption- Salinity- The movement of water- Nutrients- Organic foodstuffs- Inorganic foodstuffs- pH- Dissolved gases- Hydrostatic pressure- Life factors
Week 14	**Nitrogen transformations** The nitrogen cycle (Nitrogen fixation- Nitrogen mineralization- Nitrification- Denitrification process **The decomposition of organic matter and carbon transformations** Carbon cycle- Decomposition of organic matter- The speed of decomposition of organic matter according to its components- Humus- Carbon representation
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Soil as a medium for the growth of microorganisms
Week 2	Lab 2: The effect of environmental factors on the soil microorganisms
Week 3	Lab 3: Isolation of soil bacteria
Week 4	Lab 4: Isolation of soil Actinomycetes
Week 5	Lab 5: Isolation of soil fungi (molds and yeasts)
Week 6	Lab 6:Isolation of soil Protozoa
Week 7	Lab 7: Aquatic environment and its microorganisms
Week 8	Lab 8: The effect of environmental factors on the aquatic microorganisms

Week 9	Lab 9: Isolation and counting of bacteria in aquatic environment
Week 10	Lab 10: Isolation and counting Actinomycetes in aquatic environment
Week 11	Lab 11: Isolation and counting of molds and yeasts
Week 12	Lab 12: Isolation of algae in aquatic environment and soil
Week 13	Lab 13: Isolation of diatoms in aquatic environment and soil
Week 14	Lab 14: Sources of water pollution and Biomarker of aquatic pollution
Week 15	Lab 15: Nitrogen transformations: Nitrogen fixation, Denitrification process in aquatic environment and soil
Week 16	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1-T. K. Adhya, B. B. Mishra, K. Annapurna, D. K. Verma, U. Kumar (2017) Advances in Soil Microbiology: Recent Trends and Future Prospects. Volume 2: Soil-Microbe-Plant Interaction Springer imprint is published by Springer Nature - 2- T. K. Adhya, B. Lal, B. Mohapatra, D. Paul and S. Das (eds.) Volume 1: Soil Microbe. Springer imprint is published by Springer Nature. . 3-E. A. Paul(2015)Soil Microbiology, Ecology, and Biochemistry. Academic Press is an imprint of Elsevier. 4-D. Mara and N. Horan (2003) Handbook of Water and Wastewater Microbiology. Academic Press- An Imprint of Elsevier.	Yes
Recommended Texts	N. Okafor (2011)Environmental Microbiology of Aquatic and Waste Systems. Springer Dordrecht Heidelberg London New York	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Babylon College of Science for Women Department of Biology	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**ECOLOGY: علم البيئة**	**Module Delivery**	
Module Type	CORE	**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	UOBAB0601052		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	**Semester of Delivery**	
Administering Department		**College**	
Module Leader	Dr. Mahammed E. Al-Defiery	**e-mail**	ubs.md@uobabylon.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	

Review Committee Approval		**Version Number**	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	5
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. Understand basic theoretical and empirical approaches to the study of natural systems. 2. Learn important ecological concepts and information. 3. Improve writing skills, especially in synthesizing and interpreting complex concepts and data. 4. Understand how mathematical models can be used to help understand complex systems. 5. Develop an appreciation of nature and the services provided by intact ecosystems 6. This course will provide the fundamental information necessary for understanding the role of environmental factors 7. Investigate how the ecological concepts you learn in class relate to current environmental problems. 8. Identify the protection of species and species' subdivisions that will conserve genetic diversity. 9. Learn maintaining habitat is fundamental to conserving species. 10. All things are connected but the nature and strength of those connections vary. 11. Disturbances shape the characteristics of populations, communities, and ecosystems. 12. Climate influences terrestrial, freshwater and marine ecosystems.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.The relationships between living organisms, including humans, and their physical environment. 2. Identify the topics of interest including the biodiversity, distribution, biomass, and populations of organisms, as well as cooperation and competition within and between species. 3. Ecosystems are dynamically interacting systems of organisms, the communities they make up, and the non-living components of their environment. 4. Ecosystem processes, such as primary production, pedogenesis, nutrient cycling and niche construction and regulate the flux of energy and matter through an environment.		

	5. Discuss the processes sustained by organisms with specific life history traits. 6. Recognize that ecology is not synonymous with environmentalism or strictly natural history. 7. Ecology overlaps with the closely related sciences of evolutionary biology, genetics, and ethology. 8. Describe an important focus for ecologists to improve the understanding of how biodiversity affects ecological function. Ecology aims to Learn Outcomes: Curiosity – How does the world around us work? How are we shaped by our surroundings? Responsibility – How do our actions change our environment? How do we minimize the detrimental effects of our actions? Overfishing, habitat destruction, loss of biodiversity, climate change. Nature as a guide – The living world has been around much longer than we have and has solved many problems with creative solutions. Ecological systems are models for sustainability. How can we feed our growing population? Where will we live? Sustainability – a property of human society in which ecosystems (including humans) are managed such that the conditions supporting present-day life on earth can continue. Ecology helps us understand complex problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Life processes, interactions, and adaptation(10 hr) • The general characteristics of ecosystem, functions of an ecosystem(10 hr) • The movement of materials and energy through living communities(10 hr) • The successional development of ecosystems(10 hr) • The abundance and distribution of organisms and biodiversity in the context of the environment. (10 hr) • The energy and nutrient flow start at the individual level and the ecosystem level. (10 hr) • Numerical models of the growth of individual populations. (10 hr) • Metrics of biodiversity and responses of communities to changes. (5 hr) • Structure of the upper Atmosphere(5 hr) • Characteristics of soil(10 hr) • Laws of Limiting Factors(5 hr) • Biogeochemical cycle(5 hr) The experiments dealing: Methods: Environmental examinations (soil , water, air) (60 hr) Observations – Go into the field and see what's happening.(20 hr) Microcosms – Isolate a portion, limit factors and manipulate conditions. (10 hr) Mathematical models – Describe ecosystem interactions as equations. (10 hr)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

	The main strategy that will be adopted in introducing this unit is to encourage students to participate in discussions about the components of the environment and knowledge of environmental issues while understanding environmental concepts, natural laws, and the cycle of energy, matter and mineral elements. As well as participating in preserving the environment and fighting pollution and climate change, in addition to contributing to the application of this strategy in biology and linking it to plant, animal and microbiology sciences. This will be achieved through classes and interactive educational programs and by thinking and understanding the type of laboratory experiments that are included according to the curriculum, in addition to some field activities, homework and scientific trips.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	81	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	44	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	**Introduction of Ecology**; Ecology Define**,** History of ecology, Why study ecology, Where to study ecology?, Connections to other disciplines, The Principles of Ecology
Week 2	**General of Branches of Ecologyand Biosphere:** . Branches of Ecology, Autecology and Synecology, (Freshwater ecology, Urban ecology, Marine Ecology, Desert ecology, Forest ecology, Behavioral ecology, Molecular Ecology, Human Ecology, Soil ecology), Concepts of Ecology, Biosphere(The Lithosphere - The Hydrosphere - Atmosphere)
Week 3	**Levels of Organizations in Ecology:** Components of Environment, Biotic Components (Producers, Consumers, Decomposers), Abiotic Components, Levels of Organizations,Individual, Population, Community , Structure of a community
Week 4	**Community Interactions:** Community, Major Community, Minor Communities, Types of community interactions (Predation and adaptations to Predation, Competition,Amensalism,Mutualism, Parasitism,Commensalism,Neutralism,Cannibalism,Herbivory)
Week 5	**Ecosystem:** Definition of an Ecosystem, Components of Ecosystem, The General Characteristics of Ecosystem, Functions of an Ecosystem,Habitat destruction,Ecotone, Characteristics of Ecotone, Niche, Types of Niche, Biome(Tundra,Tropical rain forest, Savannah, Grassland)
Week 6	**Energy Flow, Food Chains and Ecological Pyramid**: Energy Flow, Kinds of Energy, Sources of Energy, Food Chain, Types of Food Chains, Food Web, Ecological pyramid(Pyramid of Numbers, Pyramid of Biomass, Pyramid of Energy), Pollutants and Trophic Level, Bioaccumulation, Biomagnification
Week 7	Mid-term Exam
Week 8	**Biodiversity**: The origin of life, Typesof Biodiversity(Genetic Diversity, Species Diversity, Ecosystem Diversity), The benefits of biodiversity conservation, Biological Resources, Ecosystem Services, Social Benefits, Human impact on biodiversity, Extinction Today, Biodiversity assessment
Week 9	**Atmosphere**:Layers of the Atmosphere(Troposphere,- Stratosphere, The ozone layer, Mesosphere, Thermosphere, Exosphere),Structure of the Upper Atmosphere(Ionosphere, Plasmasphere,Magnetosphere),Global warming and Greenhouse gases
Week 10	**The Soil**: The solid category, The mineral fraction, Organic matter fraction, The non-solid category, Characteristics of Soil, Physical Characteristics (Soil texture, Soil structure, Porosity, Soil color, Soil depth, Gravel content, Soil Water), Chemical Characteristics (Soil Nutrients, Soil pH, Organic soil), Biological Characteristics, Soil Profile and Soil horizons Soil Formation Factors(Geology, Climate, Biological activity, Time, Topography)
Week 11	**Ecological Succession:** Types of succession(Primary Succession, -Secondary Succession), Process of Succession,Climax community, Ecological Productivity, Primary Productivity, Secondary Productivity
Week 12	**Biogeochemical Cycle**: Nutrient Cycling, Types of Nutrient Cycle, The Carbon Cycle,

	Nitrogen Cycle, The Phosphorus Cycle, The Sulphur cycle
Week 13	**Laws of Limiting Factors**: .Definition of Limiting Factor, Law of minimum- Liebig's law, . Blackman's law of limiting factor, Shelford's law of tolerance
Week 14	**Population Ecology**: Age distribution, Distribution Patterns, A survivorship curve, Population Growth, Growth Forms
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Environment, ecology, the ecosystem and its components
Week 2	Lab 2: **Physical environmental factors** Temperature and its effect on organisms and other environmental factors, measuring devices
Week 3	Lab 3: Light and its effect on organisms and other environmental factors, measuring devices
Week 4	Lab 4: Humidity and its effect on living things and other environmental factors, measuring devices
Week 5	Lab 5: Rainfall and its impact on living things and other environmental factors, measuring devices
Week 6	Lab 6: Winds and their effect on living things and other environmental factors, measuring devices
Week 7	Lab 7: Water stream and their impact on living organisms and other environmental factors, measuring devices
Week 8	Lab 8:Chemical environmental factors: pH and its effect on organisms and other environmental factors, measuring devices
Week 9	Lab 9: Salinity and its effect on organisms and other environmental factors, measuring devices
Week 10	Lab 10: Electrical conductivity and its impact on living things and other environmental factors, measuring devices
Week 11	Lab 11: Biotic environmental factors: Community Interactions
Week 12	Lab 12: Density and distribution of living organisms in the environment, factors affecting, and methods of measuring them
Week 13	Lab 13:Terrestrial environment, soil
Week 14	Lab 14: The aquatic environment (oceans and seas, rivers, lakes, marshes)
Week 15	Lab 15: The Carbon and Nitrogen Cycle
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Kaushik and C.P. Kaushik. Basics of Environment and Ecology (2010), New Age International (P) Ltd., Publishers. • P. Kumar and U. Mina. Fundamentals of Ecology and Environment (2018) Pathfinder Publication. New Delhi, India • M. A. Rosen and M. Darabi. Environment, Ecology and Exergy Enhanced Approaches to Environmental and Ecological Management(2016) Nova Science Publishers, Inc • M. Begon, C. R. Townsend and J. L. Harper. Ecology From Individuals to Ecosystems.(2006) Fourth edition published Blackwell Publishing Ltd. • L. K. Wang, V. Ivanov, J. Tay, Y. Hung (2010) Environmental Biotechnology, HANDBOOK OF Environmental Engineering . Volume 10. Springer -Humana Press • K. De and A. K. De. Environment and Ecology (2009)New Age International (P) Ltd., Publishers. • M. K. Wali, F. Evrendilek and M. S. Fennessy. The Environment Science, Issues, and Solutions(2010) CRC Press Printed in the United States of America	Yes
Recommended Texts	• G. T. Miller and S. E. Spoolman. Essentials of Ecology. Fifth Edition (2009) Brooks/Cole, Cengage Learning. USA.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/environmental-science-and-sustainability	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group	**A** - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	**B** - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Organisms and resources compose ecosystems which, in turn, maintain biophysical feedback mechanisms that moderate processes acting on living (biotic) and non-living (abiotic) components of the planet. Ecosystems sustain life-supporting functions and produce natural capital like biomass production (food, fuel, fiber, and medicine), the regulation of climate, global biogeochemical cycles, water filtration, soil formation, erosioncontrol, flood protection, and many other natural features of scientific, historical, economic, or intrinsic value.