



وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي



وصف البرنامج الأكاديمي للكليات والمعاهد

للعام الدراسي 2025 - 2026

الجامعة :

الكلية / المعهد : كلية الشرق الأوسط الجامعة

القسم العلمي : علوم الحياة

تاريخ ملء الملف : 1 \ 10 \ 2025

التوقيع :

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التاريخ : 1 \ 10 \ 2025

التوقيع :

اسم رئيس القسم : أ.د. صالح عبدالقادر عبدالله

التاريخ : 1 \ 10 \ 2025



دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: م.د. جواد كاظم ايدام

التاريخ : 1 / 10 / 2025

التوقيع :

مصادقة السيد العميد

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ا.د. متمرس مثنى علوان الجشعمي

التاريخ : 1 / 10 / 2025

تصميم وتنفيذ : ا.م. فريد المصحب / 2025

اسم الجامعة :

الكلية : كلية الشرق الاوسط الجامعة

القسم العلمي : قسم علوم الحياة

اسم البرنامج الاكاديمي او المهني : بكالوريوس علوم حياة

اسم الشهادة النهائية : بكالوريوس في علوم الحياة

النظام الدراسي : فصلي

تاريخ اعداد الوصف: 2025 /10 /1

تاريخ ملء الملف: 2025 /10 /1

التوقيع:

اسم المعاون العلمي: أ.م.د حمزة كاظم الزبيدي

التاريخ: 2025/10/1

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دقق الملف من قبل

شعبة ضمان الجودة والاداء الجامعي

اسم مدير شعبة ضمان الجودة والاداء الجامعي: م.د جواد كاظم ايدام

التاريخ : 2025/10/1

التوقيع

مختتم

العميد

ا.د متمرس مثنى علوان الجشعمي

2025/10/1

رؤيا ورسالة وأهداف قسم علوم الحياة

1. رؤية البرنامج

برنامج قسم علوم الحياة يتضمن تهيئة خريجين قادرين على فهم التخصصات المتعددة لعلم الأحياء من خلال مجموعة متنوعة من المقررات الدراسية والتجارب المختبرية والبحث والعمل الجماعي. هذا المزيج من الأساليب التعليمية يقود الطلاب إلى فهم متساوٍ للتقنيات العلمية التي يستخدمها علماء الأحياء لبناء التفسيرات وتطوير الرؤى وإنشاء نظريات حول الكائنات الحية التي تسكن الكرة الأرضية. يعمل أعضاء الهيئة التدريسية في قسم علم الأحياء على إنشاء علاقة عمل وثيقة بين أعضاء هيئة التدريس والطلاب في جو طبيعي وبيئة ملائمة.

2. رسالة البرنامج

يمارس أعضاء هيئة التدريس في قسم الأحياء - كلية الشرق الأوسط الجامعة مهام متعددة الأوجه . يسعى البرنامج إلى تزويد جميع طلاب بالمعرفة النهائية لعلم الأحياء، بالإضافة إلى فهم أعمق في مجال معين من مجالات العلوم البيولوجية. تم اقتراح المناهج الدراسية والمشورة لإعداد الخريجين لمستقبلهم المهني، سواء اختاروا العمل كعلماء أحياء متخصص في مجموعة واسعة من المجالات الخاصة مثل علم الأحياء الدقيقة أو علم النبات أو الحياة الطبيعية، أو متابعة درجات علمية متقدمة في علوم الحياة أو العلوم الصحية. يقدم البرنامج في هذا القسم أيضاً المعرفة الأساسية لعلوم الحياة لدعم درجة التمريض ودرجة الدراسات الطبية الحيوية ودرجة مشارك في العلوم في تكنولوجيا الغابات. بالإضافة إلى ذلك، توفر دورات علم الأحياء تجربة العلوم المختبرية الأساسية للطلاب الذين يسعون إلى تحقيق متطلبات التعليم العام.

3. أهداف البرنامج

1. توفير تعليم شامل في علم الأحياء يؤكد على التفكير العلمي وحل المشكلات عبر مجموعة واسعة من التخصصات داخل علم الأحياء
2. لإعداد الطلاب لمجموعة واسعة من مسارات ما بعد البكالوريا، بما في ذلك الدراسات العليا، وبرامج التدريب المهني، أو وظائف مستوى الدخول في أي مجال من مجالات علم الأحياء
3. توفير تدريب عملي مكثف في مجال التكنولوجيا الإلكترونية، والتحليل الإحصائي، والمهارات المعملية، والتقنيات الميدانية
4. توفير تدريب شامل على التواصل الكتابي والشفوي للمعلومات العلمية
5. إثراء الطلاب بفرص التعليم البديل في مجال علم الأحياء من خلال البحث الجامعي والتدريب الداخلي والدراسة في الخارج

4. الاعتماد البرامجي

لا يوجد

5. المؤثرات الخارجية الأخرى

لا يوجد

6. هيكلية البرنامج

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	5	16	11%	
متطلبات الكلية	8	37	17%	
متطلبات القسم	33	187	72%	
التدريب الصيفي	لا يوجد			
أخرى				

* ممكن ان تتضمن الملاحظات فيما إذا كان المقرر أساسي او اختياري.

7. وصف البرنامج

المواد الدراسية - قسم علوم الحياة 2025-2026				كلية الشرق الاوسط الجامعة قسم علوم الحياة					
المستوى الاول- الفصل الثاني				المستوى الاول- الفصل الأول					
الوحدات ECTS	عدد الساعات		اسم المادة	ت	الوحدات ECTS	عدد الساعات		اسم المادة	ت
	عملي	نظري				عملي	نظري		
8	2	2	علم النبات العام	1	8	2	2	علم الحيوان العام	1
4	-----	2	السلامة والامن البايولوجي	2	5	توتوريال 1	2	الرياضيات العامة	2
5	1 توتوريال	2	احصاء حياتي	3	7	2	2	كيمياء تحليلية	3
8	2	2	كيمياء عضوية	4	6	2	2	فيزياء حياتية	4
3	2	1	علم الحاسوب	5	2	-----	2	حقوق انسان و الحريات	5
2	-----	2	اللغة الإنكليزية	6	2	-----	2	اللغة العربية	6

30		مجموع الوحدات		
المستوى الثاني- الفصل الأول				
الوحدات ECTS	عدد الساعات		اسم المادة	ت
	عملي	نظري		
4	2	2	علم الحشرات I	1
5	2	2	علم تشريح النبات	2
5	2	2	علم اللافقرات	3
5	2	2	مجاميع نباتية	4
5	2	2	احياء مجهرية I	5
4	2	2	كيمياء حياتية I	6
2	-----	2	اللغة الإنكليزية	7
مجموع الوحدات				
المستوى الثالث- الفصل الأول				
الوحدات	عدد الساعات		اسم المادة	ت
	عملي	نظري		
5	2	2	بايولوجية الخلية	1
5	2	2	علم البيئة	2
5	2	2	علم الانسجة	3
4	2	2	علم الفطريات	4
4	2	2	فسلجة نبات	5
5	2	2	فسلجة احياء مجهرية	6
2	--	2	اساسيات البحث العلمي	7
مجموع الوحدات				

30		مجموع الوحدات		
المستوى الثاني- الفصل الثاني				
الوحدات ECTS	عدد الساعات		اسم المادة	ت
	عملي	نظري		
4	2	2	علم الحشرات II	1
5	2	2	علم تصنيف النبات	2
5	2	2	علم الطفيليات	3
2	-----	2	جرانم حزب البعث الباند	4
5	2	2	احياء مجهرية II	5
4	2	2	كيمياء حياتية II	6
3	2	1	علم الحاسوب	7
2	-----	2	اللغة العربية	8
مجموع الوحدات				
المستوى الثالث- الفصل الثاني				
الوحدات	عدد الساعات		اسم المادة	ت
	عملي	نظري		
5	2	2	مناعة	1
5	2	2	تلوث بيئي	2
5	2	2	فسلجة حيوان	3
5	2	2	تصنيف الفطريات	4
5	2	2	وراثة عام	5
5	2	2	احياء مجهرية تربيه ومياه	6
مجموع الوحدات				

المستوى الرابع- الفصل الأول

الوحدات	عدد الساعات		اسم المادة	ت
	عملي	نظري		
5	2	2	بايولوجي جزيئي	1
5	2	2	احياء مجهرية أغذية	2
4	2	2	علم الانزيمات	3
5	2	2	تقانة احيائية وهندسة وراثية	4
5	2	2	بكتريا مرضية	5
4	2	2	تحليلات مرضية	6
2	--	2	تنوع حيوي	7
2	2		مشروع بحث تخرج	8
30	مجموع الوحدات			

المستوى الرابع- الفصل الثاني

الوحدات	عدد الساعات		اسم المادة	ت
	عملي	نظري		
5	2	2	وراثة احياء مجهرية	1
5	2	2	احياء مجهرية صناعية	2
4	2	2	علم السموم	3
4	2	2	فايروسات	4
4	2	2	مضادات حيوية	5
4	2	2	حبيبات	6
2	--	2	معالجة حيوية	7
2	2		مشروع بحث تخرج	8
30	مجموع الوحدات			

8. مخرجات التعلم المتوقعة للبرنامج

المعرفة	
تحديد العلاقات المعقدة	سيكون الخريجون قادرين على توضيح بنية ووظيفة المكونات الخلوية وشرح كيفية تفاعلها في الخلية الحية.
المهارات	
التواصل الشفهي والكتابي	سيكون الخريجون قادرين على توصيل نتائج التحقيقات البيولوجية رسميًا باستخدام مهارات الاتصال الشفهية والكتابية.
الدراسات المختبرية والميدانية	سيكون الخريجون قادرين على إجراء التجارب المعملية والدراسات الميدانية، باستخدام المعدات العلمية وتكنولوجيا الكمبيوتر مع مراعاة بروتوكولات السلامة المناسبة.
القيم	
المعرفة العلمية	سيكون الخريجون قادرين على إظهار مفهوم متوازن لكيفية تطور المعرفة العلمية، بما في ذلك التطور التاريخي للنظريات والقوانين التأسيسية وطبيعة العلم.
تحليل البيانات	سيكون الخريجون قادرين على إظهار المهارات الكمية العلمية، مثل القدرة على إجراء تحليلات بسيطة للبيانات.
التفكير النقدي	سيكون الخريجون قادرين على استخدام مهارات التفكير النقدي وحل المشكلات لتطوير مشروع بحثي أو ورقة.

9. استراتيجيات التعليم والتعلم

يركز هذا البرنامج على الكائن الحي بأكمله الذي يرتبط به كل شيء، سواء كان ذلك الجزيئات التي تشكل البروتينات أو مجتمعات الكائنات الحية في نظامنا البيئي. يتمتع جميع الطلاب بفرصة الانتقال إلى شهادتنا المتخصصة في علم الوراثة وعلم الحيوان والأحياء الدقيقة في نهاية السنة الأولى.

في المستوى الأول، يتعرف الطلاب على موضوعات أساسية مثل علم الأحياء الدقيقة العام والسلامة والأمن الحيوي بالإضافة إلى موضوعات أخرى مناسبة للتقدم إلى جميع البرامج ضمن مجموعة برنامج علم الأحياء. تتم تغطية غالبية المواضيع الأساسية الخاصة بالبرنامج في المستوى 2 للتحضير للوحدات المتخصصة في المواضيع التي تقودها الأبحاث في المستويين 3 و4. ولذلك يتم توجيه خريج علم الأحياء بالجامعة لاكتساب كيفية قيام البحث بإرشاد التدريس، وفقاً لبيانات مهمة الجامعة.

في المستوى الرابع، يتمتع الطلاب بفرصة اختيار موضوع أو موضوعين من وحداتهم الدراسية بشرط أن يتم اختيار مجموعة من الوحدات التي تعكس مدى تعقيد أشكال الحياة من الجزيئات، مروراً بالكائنات الحية، سواء النباتات أو الحيوانات، إلى المجموعات السكانية لضمان اتساع نطاقها. المعرفة المتوقعة من خريج بدرجة علم الأحياء. يتيح ذلك للطلاب تطوير اهتماماتهم واسعة النطاق في علم الأحياء العضوي. يتم اتخاذ القرارات بشأن ما سيتم دراسته بمدخلات من المعلمين الشخصيين.

يتم تطوير روح البحث وتعزيزها منذ البداية من خلال التطبيقات العملية، والتي تكون إما مضمنة في وحدات المحاضرات أو يتم تدريسها في وحدات عملية وندوات بحثية ودروس تعليمية. هناك دورة ميدانية إلزامية في المستوى 1، والتي يجب على الطلاب اجتيازها من أجل التقدم إلى المستوى 2، ودورات ميدانية اختيارية في المستوى 4. في المستوى 4، يقوم جميع الطلاب بتنفيذ مشروع بحث مستقل أو مشروع معلمي أو مزيج من كل ما سبق ذكره.

يتم عقد الدروس الأكاديمية في المستويين 1 و 2 مع نفس التدريسي، مما يوفر الاستمرارية والتوجيه التدريجي. تشمل البرامج التعليمية للمستوى الأول والثاني على عدد من ورش العمل لإظهار المهارات مثل استخدام المكتبة ومهارات العرض، تليها تمارين تقييمية (مقالات ومحادثات) كفرص لممارسة هذه المهارات في سياق موضوع محدد.

10. طرائق التقييم

اختبارات، تقارير، مشاريع، العمل في مجموعات، امتحان نصفى، امتحان نهائي

11. الهيئة التدريسية

أعضاء هيئة التدريس

الرتبة العلمية	التخصص		المتطلبات/المهارات الخاصة (ان وجدت)		اعداد الهيئة التدريسية	
	عام	خاص	ملاك	محاضر		
أستاذ	علم الاحياء	احياء مائية	1			
	علم الاحياء	علم النبات	1			
	علوم سياسية	علوم سياسية	1			
أستاذ مساعد	علم الاحياء	احياء مجهرية	1	1		1
	علم الاحياء	علم النبات	1			

	1			علم التربية	علوم زراعية	مدرس /باحث
	1			علوم الجو والفضاء	علم الفيزياء	
1				هندسة وراثية	علم الاحياء	
1				علم النبات	علوم زراعية	
	1			علم الانسجة	علوم بيطرية	
	1			كيمياء حيائية	علم الكيمياء	مدرس مساعد
1	1			احياء مجهرية	علم الاحياء	
1				حشرات	علوم زراعية	
1				لغة انكليزية	علم اللغة	
	1			قانون جنائي	علم القانون	

التطوير المهني

توجيه أعضاء هيئة التدريس الجدد

عادةً ما يقوم رئيس القسم بتعيين مرشد لأعضاء هيئة التدريس الجدد بناءً على الاهتمامات البحثية ويتطلب ذلك أن يلتقي المرشد والمتدرب عدة مرات. يمكن للمسؤولين أن يسعوا جاهدين لخلق جو يفضي إلى الإرشاد. قد يتضمن ذلك أحداثًا تشجع على مشاركة أبحاث أعضاء هيئة التدريس ومن خلال تقييم العمل التعاوني والإرشاد بشكل واضح في التقييمات.

التطوير المهني لأعضاء هيئة التدريس

يشمل تطوير أعضاء هيئة التدريس المشاركة في الأنشطة ويمكن التحقق منها (وجهًا لوجه، أو عبر الإنترنت، أو ممزوجة [وجهًا لوجه مع عناصر عبر الإنترنت]) حول أي موضوعات تساهم في تعزيز وتنمية القدرات. المعرفة أو المهارات أو التقنيات أو الوعي أو السلوكيات كتدريسي أو عالم

12. معيار القبول

يتم تنظيم معايير القبول من قبل وزارة التعليم العالي والبحث العلمي

13. أهم مصادر المعلومات عن البرنامج

عن طريق موقع الكلية

14. خطة تطوير البرنامج

- [-] تخصيص مبالغ مالية خاصة بالقسم للعمل على سد النواقص والاحتياجات للقسم
- [-] تخصيص تدريسيين للتعليم المستمر للمعنيين الجدد
- [-] تخصيص موقع خاص بالقسم
- [-] إعادة تأهيل المختبرات بالأجهزة والمستلزمات الضرورية
- [-] تعيين بكالوريوس جدد لسد النقص الموجود في كادر المختبرات التعليمي

مخطط مهارات البرنامج															
مخرجات التعلم المطلوبة من البرنامج												اساسي أم اختياري	اسم المقرر	رمز المقرر	السنة / المستوى
القيم				المهارات				المعرفة							
4ج	3ج	2ج	1ج	4ب	3ب	2ب	1ب	4أ	3أ	2أ	1أ				
				*	*	*	*	*	*	*	*	اساسي	علم الحيوان العام	Bio-111	Level 1
				*	*	*	*	*	*	*	*	اساسي	الرياضيات العامة	COS-111	
				*	*	*	*	*	*	*	*	اساسي	كيمياء تحليلية	COS-112	
				*	*	*	*	*	*	*	*	اساسي	فيزياء حيائية	COS-113	
*	*	*	*	*	*	*	*	*	*	*	*	اساسي	حقوق انسان وحريات	UOA-111	
*	*	*	*	*	*	*	*	*	*	*	*	عام	اللغة الانكليزية I	UOA-112	
				*	*	*	*	*	*	*	*	اساسي	علم النبات العام	Bio-121	Level 2
				*	*	*	*	*	*	*	*	اساسي	السلامة والامن البايولوجي	Bio-122	
				*	*	*	*	*	*	*	*	اساسي	كيمياء عضوية	COS-122	
				*	*	*	*	*	*	*	*	اساسي	احصاء حياتي	COS-121	
				*	*	*	*	*	*	*	*	اساسي	علم الحاسوب I	UOA-121	
*	*	*	*	*	*	*	*	*	*	*	*	عام	اللغة العربية I	UOA-003	
				*	*	*	*	*	*	*	*	اساسي	علم الحشرات I	Bio-211	Level 3
				*	*	*	*	*	*	*	*	اساسي	علم تشريح النبات	Bio-212	

				*	*	*	*	*	*	*	*	اساسي	علم اللاقريات	Bio-213	
				*	*	*	*	*	*	*	*	اساسي	احياء مجهرية I	Bio-214	
				*	*	*	*	*	*	*	*	اساسي	كيمياء حيائية I	Bio-215	
				*	*	*	*	*	*	*	*	اساسي	مجاميع نباتية	Bio-216	
*	*	*	*	*	*	*	*	*	*	*	*	عام	اللغة الانكليزية II	UOA-004	Level 4
				*	*	*	*	*	*	*	*	اساسي	علم الحشرات II	Bio-221	
				*	*	*	*	*	*	*	*	اساسي	علم تصنيف النبات	Bio-222	
				*	*	*	*	*	*	*	*	اساسي	علم الطفيليات	Bio-223	
				*	*	*	*	*	*	*	*	اساسي	احياء مجهرية II	Bio-224	
				*	*	*	*	*	*	*	*	اساسي	كيمياء حيائية II	Bio-225	
				*	*	*	*	*	*	*	*	عام	علم الحاسوب II	UOA-008	
*	*	*	*	*	*	*	*	*	*	*	*	عام	اللغة العربية II	UOA-002	
*	*	*	*	*	*	*	*	*	*	*	*	عام	جرائم حزب البعث البائد	UOA-001	
				*	*	*	*	*	*	*	*	اساسي	بيولوجية الخلية	Bio-311	Level 5
				*	*	*	*	*	*	*	*	اساسي	علم البيئة	Bio-312	
				*	*	*	*	*	*	*	*	اساسي	علم الانسجة	Bio-313	
				*	*	*	*	*	*	*	*	اساسي	علم الفطريات I	Bio-314	
				*	*	*	*	*	*	*	*	اساسي	فسلجة النبات	Bio-315	

				*	*	*	*	*	*	*	*	اساسي	فسلجة احياء جهرية	Bio-316	
*	*	*	*	*	*	*	*	*	*	*	*	اساسي	اساسيات البحث العلمي	Bio-317	
				*	*	*	*	*	*	*	*	اساسي	علم الوراثة عام	Bio-321	Level 6
				*	*	*	*	*	*	*	*	اساسي	التلوث البيئي	Bio-322	
				*	*	*	*	*	*	*	*	اساسي	فسلجة حيوان	Bio-323	
				*	*	*	*	*	*	*	*	اساسي	علم الفطريات II	Bio-324	
				*	*	*	*	*	*	*	*	اساسي	علم المناعة	Bio-325	
				*	*	*	*	*	*	*	*	اساسي	احياء مجهرية التربة والمياه	Bio-326	
				*	*	*	*	*	*	*	*	اساسي	البيولوجي الجزيئي	Bio-411	
				*	*	*	*	*	*	*	*	اساسي	احياء مجهرية الاغذية	Bio-412	
				*	*	*	*	*	*	*	*	اساسي	علم الانزيمات	Bio-413	
				*	*	*	*	*	*	*	*	اساسي	تقانة حيوية وهندسة وراثية	Bio-414	
				*	*	*	*	*	*	*	*	اساسي	بكتريا مرضية	Bio-415	
				*	*	*	*	*	*	*	*	اساسي	تحليلات مرضية	Bio-416	
				*	*	*	*	*	*	*	*	اساسي	تنوع وتطور حيوي	Bio-416	
				*	*	*	*	*	*	*	*	اساسي	وراثة احياء مجهرية	Bio-421	Level 8
				*	*	*	*	*	*	*	*	اساسي	احياء المجهرية الصناعية	Bio-422	
				*	*	*	*	*	*	*	*	اساسي	علم السموم	Bio-423	

				*	*	*	*	*	*	*	*	اساسي	فيروسات	Bio-424	
				*	*	*	*	*	*	*	*	اساسي	مضادات حيوية	Bio-425	
				*	*	*	*	*	*	*	*	اساسي	حبيبات	Bio-426	
				*	*	*	*	*	*	*	*	اساسي	معالجة حيوية	Bio-427	
*	*	*	*	*	*	*	*	*	*	*	*	اساسي	بحث تخرج	Bio-428	

❖ يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم

❖ في العام الدراسي الحالي 2025-2026 فان قسم علوم الحياة يعتمد نظام بولونيا للمستويات الاول والثاني والثالث والنظام الفصلي للمستوى الرابع تنفيذًا لتوجيهات وزارة التعليم العالي والبحث العلمي الموقرة التي اوعزت الى تطبيق النظام في كليات العلوم والهندسة للمستوى الاول من العام الدراسي 2023-2024 ويصعد كل سنة للمستوى الذي يليه وتماشيا مع الكلية المتوأمة مع كليتنا وهي كلية العلوم – جامعة الانبار .وسيطبق نظام بولونيا بالكامل لجميع المستويات في العام الدراسي القادم 2026-2027 .

المواد الدراسية

للمستوى الأول

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Analytical Chemistry		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	COS -112		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Zainab Jabber subber	e-mail	Zainab J.sabr@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1. The chemical separation methods course is determined according to the study plan prepared in the Applied Chemistry Department.2. The course aims to introduce students to the general concepts of chemical separation methods used in chemical measurements

	<p>3. It also aims to study in detail the types of separation methods that depend on physical or chemical properties, as well as extraction processes, purification of drinking water, fractional distillation of crude oil products, and purification of medical and chemical extracts used in daily life. It helps the student to know the composition of these materials, including medicines and extracts, separating components from their raw materials, how reactions occur, and the measurement mechanism.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>1- That the student know the general concepts of compounds in the analytical chemistry curriculum. 2- The student should be familiar with the basics and rules for naming different compounds, structural compositions, and different physical properties. . 3- The student should know the basic principles of measurement methods and separation processes, choose the most appropriate property for separation processes for each compound, obtain the best results and pure extracts, and get acquainted with each method. 4- The student should understand the importance of these methods and methods and their applications.</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>A- Methods of teaching and learning 1- Giving lectures. 2- Using the method of recitation, discussion and solving questions. 3- Giving assignments to students to strengthen them and prepare them for the final and final exams. B- Evaluation methods 1- Daily and monthly exams 2- Duties 3- In-class exercises</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>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 types of simple experiments involving some sampling activities that are interesting to the students.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to separation methods
Week 2	Distillation and type of distillations
Week 3	Extraction, its types and types of extracts

Week 4	Methods for treating contamination and purification of extracts
Week 5	Distribution Coefficient in extraction methods
Week 6	Extraction devices, their types, specifications of each device
Week 7	Organic solvents used in extraction and conditions to be met
Week 8	First month exam
Week 9	Ion exchanges , types, components, manufacturing methods, and specifications
Week 10	General rules for selectivity in ion exchangers
Week 11	Introduction to Chromatography
Week 12	Types of chromatography, types of classification
Week 13	Types of Liquid-solid chromatography
Week 14	Types of Gas-solid chromatography
Week 15	HPLC chromatography
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to separation methods
Week 2	Lab 2: Extraction by funnel separation
Week 3	Lab 3: Extraction with a scicholite and clavanger device
Week 4	Lab 4: paper chromatography
Week 5	Lab 5: separation ions by Ion exchanges
Week 6	Lab 6: study The effect of pH in chromatography
Week 7	Lab 7: separation ions using chromatography

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- General principles of chemical and weight analysis dr.	Yes

	Safaa Razouqi Al-mraab. The second part 2- Separation Methods in Chemical Analysis, Albertine Habboush, University of Baghdad. 3- Practical applications in automated chemical analyzes and separation methods - Ismail Khalil	
Recommended Texts	Approach To Modern Separation Techniques. by C-Zhou, E Almatrafi, X Tang, B Shao, W Xia... (Ph.D) (Author), 2022	No
Websites	https://www.sciencedirect.com/journal/separation-and-purification-technology/vol/292/suppl/C https://www.amazon.com/Separation-Purification-Methods-Edmond-Perry/dp/082476319X	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	(Arabic language) اللغة العربية		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA-112		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Alaa Abdl-Muhssen	e-mail	Alaa.M@muec.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	None	e-mail	None
Peer Reviewer Name	none	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>أ - تنمية معارف الطلبة للغة العربية، وأهميتها لهم. ب - أن يتعرف على شرح بعض سور القرآن الكريم، ويحفظها. ت- ان يتعرف الطالب على تاريخ الأدب، وأهم مراحل تطوره . ث- الاطلاع على شعراء لم يسبق للطلاب التعرف عليهم ج- أن يضبط الطلبة كتابة الأملاء وعلامات الترقيم.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>1. القدرة على الحفظ والاستذكار 2. القدرة على الموازنة بين لغة ادب العصر المذكور والآداب الاخرى. 3. القدرة على المشاركة الجماعية للمحتويات الادبية للمادة 4. القدرة على تقديم المقترحات وحل المشكلات 5. القدرة على التفاعل مع المصادر والمراجع</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>القران الكريم- سورة الملك ، الآيات 1-10 ، القواعد، المبتدأ والخبر الأدب- مصطلح الأدب والعصور الأدبية الإملاء- كتاب الهمة القران الكريم- سورة الملك الآيات 11-20 القواعد- كان وأخواتها الأدب- قصيدة قم للمعلم لأحمد شوقي الإملاء- كتابة الضاد والطاء القران الكريم- سورة الملك الآيات 21-30 القواعد- إن وأخواتها الأدب- قصيدة اللغة العربية لحافظ إبراهيم الإملاء- علامات الترقيم القواعد- التوابع الأدب- النثر العربي، المقامات الأدبية</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>تعتبر استراتيجيات التراكيب عن قواعد تراكيب اللغة العربية، حيث أن أفضل أسلوب في تدريس القواعد النحوية، وهو الأسلوب الطبيعي الذي يعتمد على ممارسة اللغة استماعاً، وكلاماً، وقراءة، وكتابة، وعلى هذا الأساس فالاستعمال كما يقول ابن خلدون: ومحاكاة الأساليب اللغوية الصحيحة، والتدريب عليها تدريجياً متصلاً، هو الأسلوب الأمثل في تدريس القواعد النحوية، ومن ثم لا بد أن يفسح المدرس أمام التلاميذ المجال في دروس الاستماع، والتعبير والقراءة للتدريب على القواعد النحوية، حيث يشعرون بحاجتهم إليها للفهم والتعبير والكتابة دون ضغط أو إرغام. إضافة إلى:</p> <p>1 - استراتيجية الحوار</p>
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- 2 استراتيجية السرد القصصي
- 3 التدريس باستخدام التكنولوجيا
- 4 استراتيجية إعداد المشاريع...
- 5 استراتيجية تبادل الأدوار

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	القران الكريم- سورة الملك (الآيات 1-10)
Week 2	القواعد- المبتدأ والخبر
Week 3	الأدب- مصطلح الأدب والعصور الأدبية
Week 4	الإملاء- كتاب الهمزة
Week 5	القران الكريم- سورة الملك (الآيات 11-20)
Week 6	القواعد- كان وأخواتها
Week 7	first-term Exam
Week 8	الأدب- قصيدة قم للمعلم لأحمد شوقي
Week 9	الإملاء- كتابة الضاد والظاء
Week 10	القران الكريم- سورة الملك (الآيات 21-30)
Week 11	القواعد- إن وأخواتها
Week 12	الأدب- قصيدة اللغة العربية لحافظ إبراهيم
Week 13	الأدب- النثر العربي، المقامات الأدبية
Week 14	الإملاء- علامات الترقيم
Week 15	القواعد- التوابع
Week 16	final-term Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كتاب اللغة العربية للأقسام غير الاختصاص	Yes
Recommended Texts	كتب اخرى ضمن الاختصاص ذات اسلوب أكاديمي مفصل	Yes
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biophysics		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lab
Module Code	COS -113		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Bio	College	Sci
Module Leader	Farid M. Mushib	e-mail	Farid.m.mahdi@meuc.edu.iq
Module Leader's Acad. Title	Assist professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	-----
Peer Reviewer Name	Name	e-mail	E-mail----
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Identify the foundations and systems of physics and link them to daily life activities and human activities2. Knowledge of vector and scalar quantities and the basic units of physics. Study and transform vectors, and addition, subtraction and multiplication of vectors.3. Study of movement in one dimension and calculate the acting forces and their resultant4. Study of simple harmonic motion, heat, heat quantity, friction, electricity, energy, and work, and their relationship to living organisms.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">5- A- Cognitive objectives6- A- 1 . Improving the level of comprehension (comprehension) developing the ability to interpret, predict and conclude7- A- 2 . Application capabilities development8- A-3. Providing the student with the ability to analyze9- A-4. Develop the student's ability to integrate ideas and information (synthesis level), which is the opposite of analysis10- A- 5. Evaluation: Developing the student's ability to make a judgment on the value of the material learned11- B- The skills objectives of the course12- B 1 . Improving the student's ability to observe13- B-2. To learn how to imitate and imitate.14- B-3. To learn the method of experimentation
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>General and qualifying transferable skills (other skills related to employability and personal development).</p> <ol style="list-style-type: none">1. Teaching the student oral and written communication skills2. Using modern technological tools, such as computers, the Internet, and scientific programs for preparing reports, tables, figures, and presentations.3. Encouraging the student to work collectively within a work team4. Developing the student's abilities to make optimal use of time (time management).

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 types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	5	10% (10)	Same week	LO #1, #3, #7, #9, #11, #13
	Assignments	5	10% (10)	Each following week	LO #2, #4, #6, #8, #10, #12

	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	5	10% (10)	6,13	LO #3,#5, #7, #9,#11
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1,#7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Vectors and their analysis with drawing .
Week 2	Numerical and vector multiplication with examples .
Week 3	Motion in one dimension.
Week 4	Free fall and examples.
Week 5	Simple harmonic motion.
Week 6	Classic Mechanics.
Week 7	Mid Exam
Week 8	Newton's laws of motion.
Week 9	Force and friction force
Week 10	Mathematical examples of force
Week 11	Work and its types
Week 12	Ability and examples
Week 13	Heat and amount of heat
Week 14	Optics.
Week 15	Static electricity
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: An introduction to the physics laboratory and tools
Week 2	Lab 2: Resultant force experiment.
Week 3	Lab 3: The squid pendulum experiment.
Week 4	Lab 4: Experiment to achieve Hooke's law.
Week 5	Lab 5: Fluid density experiment.
Week 6	Lab 6: Free Fall Experience.
Week 7	Lab 7: Ohm's law experiment.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	4- "Mechanics Principles and Applications" part one, Dr. Hazem Falah Sakeek Associated Professor of Physics Al-Azhar University – Gaza (2001)	Yes
Recommended Texts	1- "Mechanics Principles and Applications" part one, Dr. Hazem Falah Sakeek Associated Professor of Physics Al-Azhar University – Gaza (2001) 2- "Electrostatic Principles and Applications" part two, Dr. Hazem Falah Sakeek Associated Professor of Physics Al-Azhar University – Gaza (2001)	No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	(Computer Science I)1 علم الحاسوب		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA-121		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	1	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Marwa Atallah	e-mail	Marwa.A@meuc.edu.iq
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	M.Sc
Module Tutor	None	e-mail	None
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1. Study the principles of computer science and information technology2. Study different types of modern computers3. Introducing the student to the most important components of the computer and its systems4. Identify the types of computers used in various scientific fields5. Identify the different types of operating systems used in computers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. The student's knowledge of the main principles of computer science and information technology2. Understand the different types of computers used in various fields3. Knowing the most important components of a computer and what its parts are4. Know how to manage and store data inside a computer5. Knowledge of the most important operating systems used in computers6. Know the most important computer applications used in various magazines
Indicative Contents المحتويات الإرشادية	<p>The student studies the following most important topics:</p> <ol style="list-style-type: none">1. Stages of computer development, in addition to a brief history of the most important ancient computers (6 hours)2. General concepts in computer science in terms of types of data and methods of storing them inside the computer (5 hours)3. Computer uses in addition to its various types (5 hours)4. Study the physical components in detail and identify their most important components (8 hours)5. Programming components and applications used in computers (8 hours)6. Study numbering systems for computer science and learn about the most important ones (7 hours)7. Calculating storage space for the primary memory and secondary memory (7 hours)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Enhancing and refining students' skills in using computers, training in using their own systems, and how to develop the capabilities of efficient use of the computer through interactive lectures in the laboratory, in addition to manuscripts, papers, methodological books, PPT lectures, and files.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	introduction to Computer ,hardware and software
Week 2	computer components
Week 3	Operating system and graphical user interface
Week 4	Word processing
Week 5	Spread sheet
Week 6	Presentation software
Week 7	Mid –Exam
Week 8	Software components
Week 9	Introduction to internet and web browsers
Week 10	Application programs
Week 11	Communication and emails
Week 12	Communication and emails
Week 13	Computer troubleshooting
Week 14	Computer troubleshooting
Week 15	Exercises
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Identifying methods of installing and operating a computer
Week 2	Lab 2: Identify the most important physical components that make up a computer
Week 3	Lab 3: Applications on data storage methods and how to calculate them
Week 4	Lab 4: An application on one of the important operating systems for the computer
Week 5	Lab 5: Experimenting with some office applications on a computer

Week 6	Lab 6: Experiment and solve some counting systems used in computers
Week 7	Lab 7: Applying some anti-virus protection programs

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Book (Computer Basics and Office Applications), Part One	Yes
Recommended Texts		
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA-003		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Ayaa Abdl-rahmaan shukur	e-mail	Ayaa A.shukur@meuc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	None	e-mail	None
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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			
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أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	to enable the learner to communicate effectively and appropriately in real life situation: b. to use English effectively for study purpose across the curriculum; c. to develop interest in and appreciation of Literature; d. to develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking and Writing; e. to revise and reinforce structure already learnt.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Students will increase their awareness of correct usage of English grammar in writing and speaking. 2. Improve their speaking ability in English both in terms of fluency and comprehensibility. 3. Receive feedback on their performance through oral presentations. 4. Increase their reading speed and comprehension of academic articles. 5. improve their reading fluency skills through extensive reading. 6. Expand their vocabulary by keeping a vocabulary journal. 7. strengthen their ability to write academic papers, essays and summaries using the process approach.
Indicative Contents المحتويات الإرشادية	The course aims to develop communicative competence in English for intercultural contexts by teaching language items and communicative strategies essential for such scenarios, while at the same time giving students ample chances to output such items. The aims of this course are reflected in the content, which contains several themes, such as cultural awareness, intercultural awareness and English as a global language. Indicative content includes understanding the uniqueness of your own culture and other cultures, as well as being aware of the role culture plays in communication in English as a global language. In addition, this course allows for discussions about what it means for English to be a global language of communication and how misunderstandings and miscommunications when using English occurs. The course also includes practice in the pronunciation features that help improve intelligibility in intercultural contexts, namely the Lingua Franca Core.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<ol style="list-style-type: none"> 1. Cultivate relationships Speaking with students to know each student, helps you understand who they are, where they come from and, perhaps, gain some insight into what teaching and learning styles are most
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- effective for them.
2. Teach language skills across all curriculum topics
 3. Speak slowly and be patient: Speaking in a slower, measured cadence Being a bit more aware of your pronunciation
 4. Prioritize “productive language”
 5. Using a variety of methods to engage learning
 6. Using visual aids by the use of pictures, diagrams, charts and other visual tools.
 7. Coordinate with the ESL teacher: Such discussions can yield insights into individual students and their learning styles or challenges; they can also be helpful for sharing information about curriculum topics, potentially providing ESL teachers with ideas for highly relevant vocabulary words that can reinforce academic lessons.
 8. Pre-teach new vocabulary words that may be unfamiliar to ELLs, or even to give them a copy of the article or link to the material ahead of time.
 9. Build in some group work.
 10. Respect moments of silence: Many new language learners tend to be a little reticent and quiet, opting for silence over speaking up and saying something “wrong” in a language that is still unfamiliar. Research-based strategies for differentiating instruction to promote student learn

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

Formative assessment	Quizzes	5	10% (10)	Continues	LO #1, #2 and #10, #11
	Assignments	5	10% (10)	Continues	LO #3, #4 and #6, #7
	Projects / Lab.	1	10 % (10)	13	
	Essays	2	10% (10)	7-13	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	Unit-1 (Hello)
Week 2	Unit-2 (Your world)
Week 3	Unit-3 (Personal information)
Week 4	Unit-4 (Family and friends)
Week 5	Unit-5 (It's my life)
Week 6	Unit-6 (Every day)
Week 7	Mid-term Exam
Week 8	Unit-7 (Places I like)
Week 9	Unit-8 (Where I live)
Week 10	Unit-9 (Happy birthday)
Week 11	Unit-10 (We had a good time)
Week 12	Unit-11 (we can do it)
Week 13	Unit-12 (Thank you very much)
Week 14	Unit-13 (Here and now)
Week 15	Unit-14 (It's time to go)
Week 16	final-term Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Headway. Beginner. Student's Book by Liz and John Soars, 2019.	Yes
Recommended Texts		No
Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Botany		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-121		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Osama Qasim Abdulameer	e-mail	osama.qasim@meuc.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1- Giving the student a historical overview of botany and its branches2. The relationship of botany to other sciences3. The benefits of the plant for life and the environment botany components4. , types and locations
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Teaching the student the nature of plant growth and its diagnosis2. Knowing the parts of a plant through its apparent appearance3. Knowing the different parts of the plant from an anatomical perspective
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none">1. Study of the morphological characteristics of plants2. Study of the diagnosis of the plant reproduction process3. Study of plant nutrition4. Study of types of tissues5. The student will gain experience in the process of diagnosing plants according to different families, knowing the external appearance of each part of the plant, and introducing the student to the anatomical sections of the different parts of the plant and using the microscope.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>As a botany student, students will learn in lots of different ways, from lectures and small group tutorials to learning by doing during field work, practical lab sessions and research projects.</p> <p>Our staff are committed to great teaching and students will have lots of opportunities throughout your degree to be creative, think independently, and express your ideas.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	137	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
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	5	10% (10)	Same week	1, 3, 5,7,9
	Assignments	5	10% (10)	Each week	2, 4,6,8,10
	Projects	1	10% (10)	10	Each week
	Report/ Lab.	5	10% (10)	3, 6, 8,10,12	3, 5,7,9,11
Summative assessment	Midterm Exam	1hr	10% (10)	7	1, 2, 3,4,5,6
	Final Exam	3hr	50% (50)	16	All weeks
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	History of botany and its branches
Week 2	Study of the plant cell
Week 3	Plant cell functions and divisions
Week 4	The external appearance of the plant
Week 5	Study the root and stem
Week 6	The leaf, the flower, and the fruit
Week 7	Exam1
Week 8	Plant anatomy in terms of types of plant tissues and primary and secondary growth
Week 9	Plant physiology
Week 10	Classification of the plant kingdom
Week 11	Classification of the plant kingdom
Week 12	Gymnosperm plants
Week 13	Non-seed plants
Week 14	Non-vascular plants
Week 15	Plant anatomy in terms of types of plant tissues and primary and secondary growth
Week 16	Exam2

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Microscope
Week 2	Microscopic preparations
Week 3	Examining the plant with a microscope
Week 4	Examine the roots

Week 5	Examine the leg and its layers
Week 6	Examination of the components of the plant leaf
Week 7	Exam1
Week 8	Plant anatomy
Week 9	Plant physiology
Week 10	Laboratory cultivation
Week 11	Plant growth
Week 12	Classification of plants
Week 13	Comparison between some types of plants
Week 14	Review
Week 15	Review
Week 16	Exam2

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	General Plant, Volume One, written by Prof. Dr. Ahmed Shawky, Prof. Dr. Badri Al-Ani and others	Yes
Recommended Texts		No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	General Zoology		Module Delivery	
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	BIO-111			
ECTS Credits	8			
SWL (hr/sem)	200			
Module Level	1	Semester of Delivery		1
Administering Department	Bio	College	Middle East	
Module Leader	Shahad WaddahNasrat		e-mail	Shahad.wadhah@meuc.edu.iq
Module Leader's Acad. Title	Assistant Lect.	Module Leader's Qualification	M.Sc.	
Module Tutor	Name (if available)		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1- Develop an understanding of the diversity of animal life and an appreciation of the significance of various taxa.2- Demonstrate a basic understanding of the evolutionary history of the animal kingdom.3- Develop an understanding of the form and function of animal systems.4- Develop laboratory skills necessary for zoological study.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1- Have developed an understanding of the diversity of animal life and an appreciation of the significance of various taxa.2- Have developed a basic understanding of the evolutionary history of the animal kingdom.3- Develop an understanding of the form and function of animal systems.4- Develop laboratory skills necessary for zoological study.
Indicative Contents المحتويات الإرشادية	<p>Zoology course covers three main themes:</p> <p>Comparative physiology - the functional characteristics of animals;</p> <p>Evolutionary biology - how animals adapt to their environment, and their genetics,</p> <p>Behaviour, ecology and conservation - how animals interact with their environment and each other to support biodiversity on the planet.</p> <p>Alongside your specialist zoology modules, you'll have the flexibility to study topics across the breadth of biology to complement your knowledge. These modules are available from your first year.</p> <p>Topics range from ecology and molecular genetics that underpin conservation, to pharmacology, neuroscience and even human physiology. This flexibility allows you to study zoology in greater depth, broaden your interests or even switch to another biosciences degree program.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>As a zoology student, students will learn in lots of different ways, from lectures and small group tutorials to learning by doing during field work, practical lab sessions and research projects.</p> <p>Our staff are committed to great teaching and students will have lots of opportunities throughout your degree to be creative, think independently, and express your ideas.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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	5	10% (10)	Same week	1, 2, 3, 4
	Assignments	5	10% (10)	Each following week	1, 2, 3, 4
	Projects / Lab.	5	10% (10)	2,4,6,8,12	1, 2, 3, 4
	Report	2	10% (10)	6, 10	3, 4
Summative assessment	Midterm Exam	1hr	10% (10)	7	1, 2, 3
	Final Exam	3hr	50% (50)	16	1, 2, 3, 4
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	View of life
Week 2	Introduction to biology
Week 3	Chemistry of life (part 1)
Week 4	Chemistry of life (part 2)
Week 5	Cell structure and function(1)
Week 6	Cell structure and function(2)
Week 7	Cell structure and function(3)
Week 8	Cell cycle and cellular reproduction
Week 9	Histology and animal tissue
Week 10	Ecology
Week 11	Exam
Week 12	Animal world
Week 13	Animal physiology
Week 14	Genetics
Week 15	Immunology
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Microscope
Week 2	Microscopic preparations
Week 3	Biochemical molecules

Week 4	Investigation of carbohydrates
Week 5	Animal cell (part 1)
Week 6	Animal cell (part 2)
Week 7	Biological experiments
Week 8	Animal tissue (1)
Week 9	Exam
Week 10	Animal tissue (2)
Week 11	Animal classification
Week 12	Anatomy of mice
Week 13	Blood picture
Week 14	DNA isolation from blood
Week 15	Blood groups
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Integrated Principles of Biology 16th Ed. By Hickman et al. 2014. McGraw Hill Higher Education. Boston, MA. ISBN-13: 978-0073524214 ISBN-10: 0073524212	Yes
Recommended Texts		No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	(Human rights & freedom) حقوق انسان وحرية		Module Delivery	
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	UOA-111			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery		1
Administering Department	Bio	College	Middle East	
Module Leader	Mahdia Saleh Hassan		e-mail	Mahdia.s.hassan@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D	
Module Tutor	None		e-mail	None
Peer Reviewer Name	None		e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<p>1 - تمكين الطلبة من معرفة حقوق الانسان</p> <p>2-معرفة معنى الحرية والحقوق والواجبات</p> <p>3-معرفة مفهوم حقوق الانسان في الإسلام والقوانين الأمامية</p>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>1- ان يكون الطالب قادرا على معرفة حقوق الانسان والحرريات .</p> <p>2- ان يتعرف الطالب على معرفه تطور مفهوم الحرية في الإسلام.</p> <p>3- ان يعرف الطالب مفهوم الديمقراطية</p> <p>4 - اكتساب الطالب مفاهيم الحرية</p> <p>5- يقف الطالب على مفهوم الحرية في الإسلام</p> <p>6- تمكن الطالب من معرفة العلاقة بين الحرية والحقوق</p>
Indicative Contents المحتويات الإرشادية	<p>1- تنشئه الطلبة على معرفه الحقوق والواجبات</p> <p>2 - تعريف الطالب على مدلول الديمقراطية</p> <p>3- معرفة الطالب بمفهوم الحرية والديمقراطية في الإسلام وفي انظمة الامم المتحدة</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>- توفير الدافع النفسية لتحقيق الأهداف الوجدانية.</p> <p>- الندوات والحلقات الدراسية</p> <p>- تكليف الطلبة بالبحوث</p> <p>- الطرائق الحديثة في التقويم</p> <p>- الطرائق التقليدية بالاعتماد على الملاحظة ومعرفة أفكار الطالب</p> <p>- القدرة على تحديد ومعرفة المفاهيم .</p> <p>- اكتساب المعرفة بالأنظمة والقوانين حول الحقوق الانسانية</p> <p>- مهارات فهم الديمقراطية في انظمة العالم</p>
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)	50		
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	5	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)		
	Essays	2	10% (10)	6,13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	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	تعريف مصطلح الحرية
Week 2	حدود الحريات والضوابط
Week 3	الحرية عند العرب / المفهوم
Week 4	الحرية فلسفتها عند الامام علي (ع)

Week 5	مفهوم الحرية في الحضارات القديمة
Week 6	مراحل تطور مفهوم الحريات في اوربا
Week 7	الحرية والتحرر في أمريكا (التاريخ الحديث)
Week 8	first-term Exam
Week 9	إقرار حقوق الانسان (المفهوم)
Week 10	الحقوق الفردية والجماعية
Week 11	إقرار حقوق الانسان في الحضارات القديمة
Week 12	مفهوم حقوق الانسان في الإسلام
Week 13	المعايير الثلاثة لحقوق الانسان
Week 14	عند الامام علي عليه السلام
Week 15	رسالة الحقوق للامام زين العابدين (ع) مصطلحات ومفاهيم القانون الدولي
Week 16	final-term Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حقوق الانسان : حميد حنون الديمقراطية التوافقية : ترجمة حسني زينه مجمع متعدد	Yes
Recommended Texts	البحوث المنشورة في الجامعات	Yes
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Mathematics		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	COS-111		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Biology	College	Middle East
Module Leader	Farid M. Mahdi	e-mail	Farid.m.mahdi@meuc.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Non	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	<p>This module aims to provide students with the necessary topics such as mathematical (whether classical or probabilistic) concepts that can be applied in Biology.</p> <p>Students will have acquired fundamental skills in the evaluation of experiments, the interpretation of readings and numbers as well as the mathematical description of biological processes.</p>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>Mathematics is a very active and fast growing interdisciplinary area in which mathematical concepts, techniques, and models are applied to a variety of problems in developmental biology and biomedical sciences. Many biological processes can be quantitatively characterized by differential equations. This course introduces you to a variety of models mainly based on ordinary differential equations and techniques for analyzing these models. Mathematical concepts on nonlinear dynamics and chaos will be introduced. Use and interpret different types of data in biology. Apply knowledge of sampling to test hypotheses about problems. Interpret the results of analysis and communicate them in a clear, concise and appropriate manner. Discuss the principles of biology aspects and relate these to the decision-making and studies and the interpretation of results.</p>
Indicative Contents المحتويات الإرشادية	<p>lectures, tutorials, exercises and practice. Three-hours class and online lectures per week (total 45 hours). The tutorial will consist of a set questions put to the students to informally assess their understanding of the content of the lecture, to allow them to think about and solve example problems related to the lecture content, to express their understanding in English, and to correct any misunderstanding or gaps in their knowledge of the lecture's content.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practice classes designed to introduce you to Mathematics. At the same time, they are refining and expanding their critical thinking skills through topics covered in</p>
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lectures, including Modelling infectious disease transmission, Enzyme kinetics, modelling of molecular biology, and Descriptive and inferential statistics.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	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	5	10% (10)	Continues	
	Assignments	5	10% (10)	Continues	
	Projects / Lab.	1	10% (10)	10	
	Report	2	10% (10)	4,10	
Summative assessment	Midterm Exam	1	10% (10)	7	
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Calculus
Week 2	Slope of straight line
Week 3	Equation of straight line and circle
Week 4	Inequalities
Week 5	Absolute value function
Week 6	Graph of functions
Week 7	Limit and continuity
Week 8	Limit and continuity (continued)
Week 9	Derivative I
Week 10	Exam
Week 11	Derivative II
Week 12	Logarithmic functions
Week 13	Exponential function
Week 14	Trigonometric functions
Week 15	Applications of derivative
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Mathematical Modelling in Systems Biology: An Introduction. Brian P. Ingalls (2022). MIT Press.	No
Recommended Texts		No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Organic Chemistry		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	COS-122		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Zainab Jabber subbar	e-mail	Zainab J.sabr@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	2.0

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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1- Introduce the student to the types of bonds in organic compounds2- Introducing the student to methods of preparation, properties and reactions of alkanes3- Introducing the student to the methods of preparation, properties and reactions of alkynes and alkenes4- Introducing the student to the methods of preparation, properties, and reactions of alkyl halides, alcohols, and carboxylic acids
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1-The student knows the types of hybridization and chemical bonds in organic compounds2- The student knows how to write reaction equations and preparation methods for some of the studied compounds3- The student knows how to write and name the organic compounds studied in the course according to international rules4- The student's knowledge of methods for preparing the organic compounds studied theoretically and practically5- The student's knowledge of methods for separating and purifying organic materials theoretically and practically
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none">1-Developing the student's ability to deal with modern technical means2- Developing the student's ability to deal with the Internet3- Developing the student's ability to deal with multiple media4- Developing the student's ability to dialogue and discuss

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>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 types of simple experiments involving some sampling activities that are interesting to the students.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	Same week	LO #1, #2 and #10, #11
	Assignments	5	10% (10)	Each week	LO #3, #4 and #6, #7, #9, #11, #13
	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	5	10% (10)	3,5,7,10,13	LO #3, #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Structure and bonding
Week 2	Hybridization and Isomers
Week 3	Functional Group

Week 4	Naming of alkane and alkyl group
Week 5	Preparation and reaction
Week 6	Naming and alkene chemical Properties
Week 7	Organic solvents used in extraction and conditions to be met
Week 8	First month exam
Week 9	Preparation and reaction
Week 10	Naming and alkyne chemical Properties
Week 11	Preparation and reaction
Week 12	Naming and Properties
Week 13	Reactions
Week 14	Preparation and reaction
Week 15	Preparation and reaction
Week 16	the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Structure and bonding
Week 2	Lab 2: Hybridization and Isomers
Week 3	Lab 3: Functional Group
Week 4	Lab 4: Naming of alkane and alkyl group
Week 5	Lab 5: Naming and alkyne chemical Properties
Week 6	Lab 6: Preparation and reaction
Week 7	Lab 7: Preparation and reaction

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Organic chemistry Morrison and Boyd	Yes
Recommended Texts	Organic Chemistry By Graham and Selmi	No
Websites	Organic chemistry Francis Carey	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biostatistics		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	BIO-123		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	Biology	College	Middle East
Module Leader	Farid M. Mahdi	e-mail	Farid m.mahdi@meuc.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Non	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1. Know the types of distributions and focus on the normal distribution of data.2. Learn about determining the sufficient number of samples according to the data dispersion system.3. Knowledge of the most important statistical tests used in biological research
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Enabling the student to choose the appropriate statistical analysis for the research problem.2. Enabling the student to conduct factorial and non-factorial tests.3. The skill of applying what the student learns during the course in his future professional life.4. Skill in analyzing variation in biometrics.
Indicative Contents المحتويات الإرشادية	lectures, tutorials, exercises and practice. Two-hours class . The tutorial will consist of a set questions put to the students to informally assess their understanding of the content of the lecture, to allow them to think about and solve example problems related to the lecture content, to express their understanding in English, and to correct any misunderstanding or gaps in their knowledge of the lecture's content.

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 as well as a series of lectures and practice classes designed to introduce you to Biostatistics. At the same time, they are refining and expanding their critical thinking skills through topics covered in lectures, including Modelling infectious disease transmission, Enzyme kinetics, modelling of molecular biology, and Descriptive and inferential statistics.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
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	5	10% (10)	Continues	1,2,3,4,5,6,7,8,9,10,11,12
	Assignments	5	10% (10)	Continues	1,2,3,4,5,6,7,8,9,10,11
	Projects	1	10% (10)	12	All
	Report/ Lab.	2	10% (10)	4,10	1,2,3,4,5,6,7,8,9,10
Summative assessment	Midterm Exam	1	10% (10)	7	1,2,3,4,5,6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to biostatistics
Week 2	Measures of central tendency
Week 3	Mode
Week 4	Measures of Variation or Dispersion
Week 5	Mean Deviation
Week 6	Standard Deviation and Variance
Week 7	Exam
Week 8	Coefficient of Variation
Week 9	Skewness
Week 10	Kurtosis
Week 11	Correlation
Week 12	The properties of correlation coefficient
Week 13	Regression
Week 14	simple linear regression
Week 15	Non- Linear Regression
Week 16	final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Mathematical Modelling in Systems Biology: An Introduction. Brian P. Ingalls (2022). MIT Press.	No
Recommended Texts		No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Safety and biosecurity		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	BIO-122		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	1	Semester of Delivery	
Administering Department	Biology	College	Middle East
Module Leader	Saleh Abdl-kader Abdallah	e-mail	Saleh.A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Non	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1.The student learned the concepts of biosafety and biosecurity.2 . Teaching the student how to deal with biological and chemical materials.3. Teaching the student how to protect himself and his colleagues from dangerous biological and chemical materials.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1.Learn about local and international guidelines and how to apply them carefully.2. Developing the student's ability to deal with intellectual questions and brainstorming.3.Developing the spirit of maintaining personal and collective safety.4.Expanding the student's ability to understand biosafety laws.
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none">1.Delivering theoretical lectures using Power Point.2. Providing students with printed lectures in PDF format from modern and diverse scientific sources.3. Ask direct questions and involve students in the discussion.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<ol style="list-style-type: none">1.Monthly and semi-semester exams.2. Direct short tests (Quiz) or electronic ones using (Quiz) Google Form.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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	5	10% (10)	Continues	1,3,5,7,9,11
	Assignments	5	10% (10)	Continues	2,4,6,8,10,12
	Projects	1	10% (10)	13	All
	Report/ Lab.	2	10% (10)	4,12	2,3,4,5,6,7,8,9,10,11
Summative assessment	Midterm Exam	1	10% (10)	7	1,2,3,4,5,6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to occupational safety
Week 2	The importance of biosafety
Week 3	Occupational risks
Week 4	Occupational risks
Week 5	Biosafety instructions
Week 6	Biosafety instructions
Week 7	Exam
Week 8	Work permits in laboratories
Week 9	Laboratory classification
Week 10	Laboratory classification
Week 11	Pathogenic microorganisms
Week 12	Pathogenic microorganisms
Week 13	Biological risks
Week 14	Biological risks

Week 15	Warning and advisory signs
Week 16	final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biosafety in laboratories World Health Organization (2004)	No
Recommended Texts	Science of Occupational Safety and Health Management by Dr. Youssef Al-Tayeb (2012)	No
Websites	https://www.unep.org/ar/explore-topics/biosafety/about-alslamt-alahyayyt	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

المواد الدراسية

للمستوى الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	General Microbiology1		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	Bio-214			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		3
Administering Department	Bio	College	Meddle East University	
Module Leader	Dania Abedl-karim Ali		e-mail	Dania A.A. @meuc.edu.iq.
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/10/2025		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 Objectives أهداف المادة الدراسية	<p>This course covers the fundamental principles of microbiology by looking at the bacteria that live on our world and their impact on the ecosystem. This impact is examined in Introduction to Microbiology through the lens of all fields of microbiology. Students will evaluate the impact of microbiology as well as the problems and opportunities that result from our changing interaction with and understanding of microbes in the twenty-first century. Students will investigate the science of microbes as well as the social issues and concerns relevant to the field of microbiology, such as emerging infectious disease, antibiotic resistance, the anti-vaccine movement, and dual-use biological research, through short lectures, case studies, in-class group work, and homework projects.</p>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1 .Describe the structural and functional differences that exist among all microorganisms.2 .Apply fundamental principles of life chemistry to microbial metabolism and physiology.3 .Evaluate the impact of microorganisms in their native settings on biosphere maintenance.4 .Compare and contrast the interactions of microbes with hosts in health and disease.5 .Identify important microbial relationships and demonstrate how these interactions affect plant and animal health.6 .Describe the fundamental ideas underpinning the methods employed to restrict microbial development.7 .Explain the flow and control of genetic information, as well as its impact on the evolution of life on Earth.8. Investigate the use of bacteria in water safety and food production.
Indicative Contents المحتويات الإرشادية	<p>The targeted general learning outcomes.</p> <p>Students who successfully complete the program will be able to: Demonstrate the improvement of practical/technical abilities.</p> <p>Analyze, assess, and appropriately interpret data.</p> <p>Effectively communicate and deliver information.</p> <p>As part of self-directed learning, obtain and use information from a range of sources.</p> <p>Within the context of self-directed learning, they manage their time and employ their organizational abilities.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The course grade will be based on exams, in-class participation & group work and homework assignments
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	2,4,6,8,10, and 12	LO #1, #3,#5,#7,#9 and #11,
	Assignments	5	10% (10)	3,5,7,9,11,	LO #2, #4 ,#6 and #8, #10,#12

				and 13	
	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	5	10% (10)	2,4,6,8,10	LO #3, #5,#7 and #9#11
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Microbiology
Week 2	Microbial Taxonomy and Domain System
Week 3	Classification of Bacteria part one
Week 4	Classification of Bacteria part 2 and Systematic Bacteriology
Week 5	Morphology of Bacteria
Week 6	Growth and physiology of bacteria part one
Week 7	Mid Term exam
Week 8	Growth and physiology of bacteria part two
Week 9	Cytoplasmic Membrane part one
Week 10	Cytoplasmic Membrane part two (active and passive transport)
Week 11	Growth curve and Factors Affecting Growth of Bacteria
Week 12	Metabolism Part one
Week 13	Metabolism Part two
Week 14	Electron Transport Chain
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Biosafety procedure and precaution and microscope
Week 2	Tool, instruments and equipment
Week 3	Staining methods of bacteria
Week 4	Acid fast stains (Ziehl –Nielson technique) and special stains
Week 5	Capsules stain and their types
Week 6	Culture media preparation and their types
Week 7	Growing and cultivation of the bacterial species in the lab.
Week 8	Biochemical tests
Week 9	<i>Enterobacteriaceae</i>
Week 10	<i>Ecoli</i> genus
	<i>Klebsiella</i>
	<i>Proteus</i> genus

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Microbiology: an introduction / Gerard J. Tortora, Berdell R. Funke, Christine L. Case. - 12th ed.	Yes
Recommended Texts	Microbiology-Textbooks. I. Funke, Berdell R. II. Case, Christine L., 1948- III . Title. [DNLM: I . Microbiology. QW 4 T712m 20 I 6 I	No
Websites	www.pearsonhighered.com	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	General Microbiology II		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar	
Module Code	BIO-224			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		2
Administering Department	Bio	College	Sci	
Module Leader	Dania Abedlkreem Ali		e-mail	Dania A.A.@meuc.edu.iq
Module Leader's Acad. Title	Assist. Lect.	Module Leader's Qualification	Ms.c.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Topics include the various groups of microorganisms, their structure, physiology, genetics, microbial pathogenicity, infectious diseases, immunology, and selected practical applications. Upon completion, students should be able to demonstrate knowledge and skills including microscopy, aseptic technique, staining, culture methods, and identification of microorganisms.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Comparative characteristics of microbial organisms2. General bacteriology and microbial techniques.3. Microbial metabolism and enzymes.4. Physical and chemical microbial control5. Collection and handling of laboratory specimens.6. Microbial genetics, mutation and biotechnology.7. Pathogenicity, virulence, and epidemiology8. Disease transmission and control of nosocomial infections9. Body defenses, immunology, and hypersensitivity10. Common bacterial, fungal, and viral diseases.11. Experimentation in clinical scenarios.
Indicative Contents المحتويات الإرشادية	<p>The targeted general learning outcomes.</p> <p>Students who successfully complete the program will be able to: Demonstrate the improvement of practical/technical abilities.</p> <p>Analyze, assess, and appropriately interpret data.</p> <p>Effectively communicate and deliver information.</p> <p>As part of self-directed learning, obtain and use information from a range of sources.</p> <p>Within the context of self-directed learning, they manage their time and employ their organizational abilities.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The course grade will be based on exams, in-class participation & group work and homework assignments
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Microbial Diversity – Prokaryotes, Eukaryotes, and Viruses
Week 2	Replication, Transcription, Translation part I
Week 3	Replication, Transcription, Translation Part II
Week 4	Replication, Transcription, Translation Part III
Week 5	Mutations and Genetic Control Part I
Week 6	Mutations and Genetic Control Part II
Week 7	Mid Term exam
Week 8	Microbial Interactions – The Build Environment
Week 9	The Human Microbiome
Week 10	Control of Microbes
Week 11	Clinical Microbiology (Epidemiology and Pathogenicity)
Week 12	Diseases of the gastrointestinal tract
Week 13	Diseases of the respiratory tract
Week 14	Diseases of the genitourinary tract
Week 15	Diseases of the blood and lymph
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Serial dilution
Week 2	Antimicrobial sensitivity
Week 3	Advanced Biochemical test
Week 4	DNA extraction
Week 5	Transformation
Week 6	Electrophoresis
Week 7	Pathogens identification
Week 8	Poster project
Week 9	Poster project
Week 10	Poster presentation
Week 11	Poster presentation
Week 12	Poster presentation
Week 13	Poster presentation
Week 14	Poster presentation
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Microbiology: an introduction / Gerard J. Tortora, Berdell R. Funke, Christine L. Case. - 12th ed.	Yes
Recommended Texts	Microbiology-Textbooks. I. Funke, Berdell R. II. Case, Christine L., 1948- III . Title. [DNLM: I . Microbiology. QW 4 T712m 20 I 6 I	No
Websites	www.pearsonhighered.com	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Plant anatomy		Module Delivery	
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	Bio 212			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		3
Administering Department	Bio	College	Meddle East University	
Module Leader	Osama Qasim Abdulameer		e-mail	osama.qasim@meuc.edu.iq
Module Leader's Acad. Title	Lect.	Module Leader's Qualification	PhD.	
Module Tutor	Name (if available)	e-mail	None	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives أهداف المادة الدراسية</p>	<ol style="list-style-type: none">5. understanding the diversity of plant anatomy between different plants.6. Demonstrate a basic understanding of the evolutionary history of the plant tissue.7. understanding the form and function of plant tissue.8. Developing the laboratory skills necessary to study the anatomy of plant tissues.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">4. Have developed an understanding of the diversity of plant anatomy and an appreciation of the significance of various taxa.5. Have developed a basic understanding of the evolutionary history of the plant tissue.6. Develop an understanding of the form and function of plant tissue.7. Develop laboratory skills necessary to study the anatomy of plant and its parts.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Plant anatomy course covers three main themes:</p> <ul style="list-style-type: none">• It includes the study of the functions of various plant organs, the function of each organ, how plants adapt to their environment, and how they adapt anatomically and functionally. How plants interact with their environment• The student learns the basics of plant anatomy, how to make histological sections of different plants from different environments, and the histological and anatomical differences between them.• Topics range from ecology, cell science, plant physiology, and plant taxonomy. This flexibility allows you to study plant anatomy in greater depth, and expand your interests for a degree in plant biosciences

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>As a plant anatomy or botany student, students will learn in lots of different ways, from lectures and small group tutorials to learning by doing during field work, practical lab sessions and research projects.</p> <p>Our staff are committed to great teaching and students will have lots of opportunities throughout your degree to be creative, think independently, and express your ideas.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	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	5	10% (10)	2,4,6,8,10, and 12	LO #1, #3,#5,#7,#9 and #11,

	Assignments	5	10% (10)	3,5,7,9,11, and 13	LO #2, #4 ,#6 and #8, #10,#12
	Projects	1	10% (10)	Continuou s	All
	Report/ Lab.	5	10% (10)	2,4,6,8,10	LO #3, #5,#7 and #9#11
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of plant anatomy , plant cell, cell wall
Week 2	PROTOPLASMIC COMPONENTS (part 1)
Week 3	PROTOPLASMIC COMPONENTS (part 2)
Week 4	NONPROTOPLASMIC COMPONENTS (part 1)
Week 5	NONPROTOPLASMIC COMPONENTS (part 2)
Week 6	The tissues , meristematic tissues
Week 7	Exam
Week 8	Permanent Tissues
Week 9	The epidermis
Week 10	Vascular tissue, xylem
Week 11	Vascular tissue , phloem

Week 12	Root anatomy, longitudinal section
Week 13	Root anatomy , cross section
Week 14	The stem , structure of stem
Week 15	Stem, cross section
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Microscope
Week 2	Microscopic preparations
Week 3	Plant cell, living component
Week 4	Plant cell, Non-living components
Week 5	Cell wall, primary pit fields
Week 6	Cell wall, pits
Week 7	Plant tissues , Meristematic Tissues
Week 8	Plant tissue, permanent tissue
Week 9	Exam
Week 10	Parenchyma tissue
Week 11	Collenchyma tissue
Week 12	Sclerenchyma tissue
Week 13	The epidermis
Week 14	Vascular tissue, xylem, cross section of root
Week 15	Vascular tissue ,phloem, cross section of stem
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Evert, R. F. (2006). Esau's plant anatomy: meristems, cells, and tissues of the plant body: their structure, function, and development. John Wiley & Sons.	Yes
Recommended Texts		No
Websites		

Grading Scheme

مخطط الدرجات (يترك بدون أي تغيير)

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Plant Taxonomy		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-222		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Osama Qasim Abdulameer	e-mail	osama.qasim@meuc.edu.iq
Module Leader's Acad. Title	Lect.	Module Leader's Qualification	Ph.D.
Module Tutor	None	e-mail	None
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1. Definition of plant taxonomy and its relationship to other sciences.2. Study of the vegetative structure of plants.3. Study of the reproductive structures of plants.4. Identification, isolation and classification of plant species of different plant families
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <ol style="list-style-type: none">1. Understanding the vegetative and reproductive structures of different plants.2. Knowing the methods of collecting plants and methods of diagnosing them.3. Knowing the differences between flowering, seed, dicotyledonous and monocotyledonous plants.4. Conducting field trips to teach students how to collect plant samples5. Identifying plant species and identifying the plant families to which they belong.6. 3- Drying and preserving plant samples for long periods
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Identify the objectives of taxonomy and important scientific terminology [4 hrs]</u></p> <p><u>Study the types and shapes of roots [4 hrs]</u></p> <p><u>Study the types and shapes of stems [4 hrs]</u></p> <p><u>Study the types and shapes of leaves [4 hrs]</u></p> <p><u>Study the types and shapes of flower [4 hrs]</u></p> <p><u>Identifying the type of diastasis in plants and the types and characteristics of fruits [8 hrs]</u></p> <p><u>Study of pollination methods [2 hrs]</u></p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical classes designed to introduce them to plant taxonomy. Assign the student to make a diagnosis of different plant species. Conducting field trips to teach students how to collect plant samples</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	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	6	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	4	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	4	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction in plant taxonomy
Week 2	Plant taxonomy goals
Week 3	Study the types and shapes of roots
Week 4	Study the types and shapes of roots

Week 5	Study the types and shapes of stems
Week 6	Study the types and shapes of stems
Week 7	Study the types and shapes of leaves
Week 8	Study the types and shapes of leaves
Week 9	Study the types and shapes of flower
Week 10	Study the types and shapes of flower
Week 11	Identifying the type of placentation in plants
Week 12	Identifying the type of diastasis in plants
Week 13	Identifying the types and characteristics of fruits
Week 14	Pollination methods
Week 15	floral equation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction in plant taxonomy
Week 2	Root
Week 3	Stem
Week 4	Stem
Week 5	Leaves
Week 6	Leaves
Week 7	Flower
Week 8	Flower
Week 9	Placentation
Week 10	Placentation
Week 11	Fruit
Week 12	Fruit

Week 13	Project
Week 14	Project
Week 15	Project

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Plant taxonomy (Ali Hussein Al-Musawi)	Yes
Recommended Texts	Classification of the botanist (Dr. Raafat Hassan Abdel-Wahhab)	No
Websites	https://wfoplantlist.org/plant-list/ http://www.theplantlist.org/	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	(Computer Science II) علم الحاسوب 2		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA-008		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Marwa Atalla Mustafa	e-mail	Marwa A.@ meuc.edu.iq
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	M.Sc
Module Tutor	None	e-mail	None
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">6. Study the principles of computer science and information technology7. Study different types of modern computers8. Introducing the student to the most important components of the computer and its systems9. Identify the types of computers used in various scientific fields10. Identify the different types of operating systems used in computers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. The student's knowledge of the main principles of computer science and information technology2. Understand the different types of computers used in various fields3. Knowing the most important components of a computer and what its parts are4. Know how to manage and store data inside a computer5. Knowledge of the most important operating systems used in computers6. Know the most important computer applications used in various magazines
Indicative Contents المحتويات الإرشادية	<p>The student studies the following most important topics:</p> <ol style="list-style-type: none">1. Stages of computer development, in addition to a brief history of the most important ancient computers (6 hours)2. General concepts in computer science in terms of types of data and methods of storing them inside the computer (5 hours)3. Computer uses in addition to its various types (5 hours)4. Study the physical components in detail and identify their most important components (8 hours)5. Programming components and applications used in computers (8 hours)6. Study numbering systems for computer science and learn about the most important ones (7 hours)7. Calculating storage space for the primary memory and secondary memory (7 hours)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Enhancing and refining students' skills in using computers, training in using their own systems, and how to develop the capabilities of efficient use of the computer through interactive lectures in the laboratory, in addition to manuscripts, papers, methodological books, PPT lectures, and files.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Security and network
Week 2	E-commerce
Week 3	Computer troubleshooting
Week 4	Introduction to AI
Week 5	AI in our daily lives
Week 6	Applications of AI
Week 7	Mid –Exam
Week 8	AI and society
Week 9	AI and society
Week 10	Ethical challenges in AI
Week 11	Ethical challenges in AI
Week 12	The future of AI
Week 13	The future of AI
Week 14	Exercises
Week 15	Exercises
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Identifying methods of installing and operating a computer
Week 2	Lab 2: Identify the most important physical components that make up a computer
Week 3	Lab 3: Applications on data storage methods and how to calculate them
Week 4	Lab 4: An application on one of the important operating systems for the computer
Week 5	Lab 5: Experimenting with some office applications on a computer
Week 6	Lab 6: Experiment and solve some counting systems used in computers
Week 7	Lab 7: Applying some anti-virus protection programs

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Book (Computer Basics and Office Applications), Part One	Yes
Recommended Texts		
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Entomology II		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Practical
Module Code	Bio-221		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Raneem Mohammed Abd Aljalel	e-mail	Ranem.Mohammed@meuc.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	None	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Bio-211	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1 Identify and distinguish types of insects. B. The student will be able to distinguish between beneficial and harmful insects. c. The possibility of dealing with insects in a scientific way.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	7. Know the terminology used in entomology 8. The possibility of classifying insects scientifically and can distinguish different species and learn about their environment 9. Breeding insects in laboratories 10. pest control 11. How to deal with insects 12. methods of collecting insects 13. Methods of hardening and collecting insects 14. Delivering information to society in a scientific way 15. Identify the areas where insects are found

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical classes.</p> <p>At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are insecta, their basic characteristics, structure and classification.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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	5	10% (10)	2,4,6,8 , 10	LO #1, #2, #4, #6, #8 and #10, #11
	Assignments	5	10% (10)	2 to 12	LO #3, #4 and #6, #7, #9
	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	2	10% (10)	6,12	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	To study about characters of Phylum Arthropoda.
Week 2	classification of insects
Week 3	characters and classification of order Orthoptera.
Week 4	characters and classification of order Hemiptera.
Week 5	characters and classification of order Phtheraptera.
Week 6	characters and classification of order Lepidoptera.
Week 7	Mid exam
Week 8	characters and classification of order Hymenoptera.
Week 9	characters and classification of order Diptera
Week 10	characters and classification of order Coleoptera
Week 11	characters and classification of order Isoptera.
Week 12	characters and classification of order Neuroptera.
Week 13	Identification for different Orders using pictorial keys
Week 14	key to major families of Orthoptera, Hemiptera (Heteroptera , Homoptera) and Coleoptera
Week 15	Entomological methods.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Orthoptera.
Week 2	Lab 2; Hemiptera.
Week 3	Lab 3: Phtheraptera.
Week 4	Lab 4; Lepidoptera.
Week 5	Lab 5: Hymenoptera.

Week 6	Lab 6: Diptera and Neuroptera.
Week 7	Lab 7: Coleoptera and Isoptera.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- PRACTICAL MANUAL CLASSIFICATION OF INSECTS((Prof. Neerja Agrawal Emeritus Professor (ICAR) 2021)) 2-The Insects(An Outline of Entomology) P.J. Gullan and P.S. Cranston/ Department of Entomology, University of California, Davis, USA	No
Recommended Texts	- PRACTICAL MANUAL CLASSIFICATION OF INSECTS((Prof. Neerja Agrawal Emeritus Professor (ICAR) 2021))	No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Parasitology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-223		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Raneem Mohammed Abd Aljalel	e-mail	Ranem.mohammed@meuc.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	Ms.c>
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	NON	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. Realize the importance of parasitology. 2. Understand the scope and principles of parasitology. 3. Recognize parasitic criteria, adaptations and requirements from their hosts. 4. Illustrate the main parasitic animals with their life cycles. 5. Realize the impact of parasites on human health and economy. 6. Define the scope and importance of immunology. 7. Recognize the principles and types of immunity. 8. Identify the mechanisms of immune response. 9. Discuss the disorders of the immune system and their pathogenic impacts
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> A. Knowledge and understanding <ol style="list-style-type: none"> 1 - Parasitology: - Demonstrate the taxonomic affiliation of specific parasitic examples. 2 - Discuss the adaptations of parasites and their host specificity. 3 - Compare the life cycles of various parasites. B. mental skills <ol style="list-style-type: none"> 1-Dissect selected parasitic examples. 2 - Identify the economic and medical losses due to parasitic infections. 3 - Gain the practical skills of identifying, classifying and drawing parasitic examples. C. Professional skills <ol style="list-style-type: none"> 1 - Immunology: -Correlate the immune disorders with certain pathological manifestation. 2 - Discuss the relation of immunity with allergy and environmental factors D. General skills <ol style="list-style-type: none"> 1 - Show the risk factors autoimmunity and the acquired immunity defecincy syndrome (AIDS) et
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<ol style="list-style-type: none"> 1-Introducing parasitology 2-Medical veterinary and economic importance 3- Parasitic association, criteria and requirements 4- Host-parasitic relationships. 5- Survery of various taxa of parasites with life cycles of specific examples from: Protozoa-platyhelmenthes-nematodes-acanthocephala-arthropoda 6- Emphasis on local and human parasites with their distinctive features, impacts and control measures 7-Introducing immunology - Principles of immunology

	8- Types of immunity - Specific and non specific 9- Innate and acquired - Tissue and humoral 10- Active and passive 11- Antigen- antibody reaction 12- Immunity failure and diseases 13- Immunity and allergy 14- Immunity and transplantation. 15- Future prospects of immunology.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1 - Understanding parasitology as a term and its association in different fields. 2 - Identifying the stages of development of this topic and its achievements in various fields. 3 - Identify the most important techniques used to develop the ability to accurately diagnose parasites, develop the student's ability to describe and study parasites in different environments, and identify the classification keys to reach a knowledge of the genus and type of the parasite. 4 - Linking the theoretical information that the student had previously learned in the previous stages with its practical application in the laboratory.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	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	5	10% (10)	3 to 12	LO #2, #4 , #6 , #8, #10, #12
	Assignments	5	10% (10)	2 to 12	LO #3, #4, #6, #8 and #10, #12
	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	2	10% (10)	6 ,13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	General characteristics of parasites
Week 2	Their benefits and harms parasite environment
Week 3	Sexual reproduction of parasites
Week 4	Asexual reproduction in parasites
Week 5	Classification of parasites
Week 6	Elementary Division
Week 7	Ciliate Division
Week 8	Division of Flatworms

Week 9	Phylum Sporoderms with a compound apex
Week 10	Cryptosporidium genus
Week 11	Condy's arcuate
Week 12	blood lace
Week 13	Imprtant of flagellate
Week 14	Nematodes
Week 15	Platyhelminthes
Week 16	Sarcodina

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: ntroduction of parasitology
Week 2	Lab 2: Type of parasite
Week 3	Lab 3: Types of hosts
Week 4	Lab 4: Diagnosis of Parasitic Diseases
Week 5	Lab 5: FILARIASIS, LEISHMANIASIS, TOXOPLASMOSIS& TRYPANOSOMIASIS
Week 6	Lab 6: INTESTINAL AND UROGENITAL PROTOZOA COLLECTION OF FAECAL SAMPLES
Week 7	Lab 7: - INTESTINAL NEMATODES

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	©2006 by Dawit Assafa, Ephrem Kibru, S. Nagesh,, Solomon Gebreselassie, Fetene Deribe, Jemal Ali	No

Recommended Texts	DT John - 2012 - books.google.com	No
Websites	2019Jan.16 [cited 2023Jun.14];29(2). Available from: http://journal.tishreen.edu.sy/index.php/hthscnc/article/view/6465	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Entomology I		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Practical
Module Code	Bio-211		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Raneem Mohammed Abd Aljalel	e-mail	Ranem.mohammed@muec.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	Ms.c
Module Tutor	No T.	e-mail	E-mail...
Peer Reviewer Name	e-mail
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	1 Identify and distinguish types of insects. B. The student will be able to distinguish between beneficial and harmful insects. c. The possibility of dealing with insects in a scientific way
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	16. Know the terminology used in entomology 17. The possibility of classifying insects scientifically and can distinguish different species and learn about their environment 18. Breeding insects in laboratories 19. pest control 20. How to deal with insects 21. methods of collecting insects 22. Methods of hardening and collecting insects 23. Delivering information to society in a scientific way 24. Identify the areas where insects are found

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 as well as a series of lectures and practical classes. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are insecta, their basic characteristics, structure and classification.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
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الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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	5	10% (10)	2,4,6,8,10, and 12	LO #1, #3,#5,#7,#9 and #11,
	Assignments	5	10% (10)	3,5,7,9,11, and 13	LO #2, #4 ,#6 and #8, #10,#12
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	5	10% (10)	2,4,6,8,10	LO #3, #5,#7 and #9#11
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction
Week 2	General classification of insects
Week 3	General anatomy of the insect's
Week 4	body, head area

Week 5	Eyes and antea in an insects
Week 6	The thorax region in insects
Week 7	Exam
Week 8	The thorax region in insects
Week 9	The thorax region in insects
Week 10	Digestive system in insects
Week 11	Digestive system in insects
Week 12	The nervous system in insects
Week 13	The nervous system in insects
Week 14	Circulatory system in insects
Week 15	Circulatory system in insects
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction
Week 2	General charecters of insects
Week 3	The Head and its types according mouth parts directs
Week 4	Antenna types
Week 5	Eyes
Week 6	Mouth parts(part1)
Week 7	Mouth parts (types 2)
Week 8	The legs
Week 9	The wings
Week 10	Scales dissection
Week 11	Couplings of wings
Week 12	Abdomen appendags

Week 13	Distinguish between genders
Week 14	Quizzes
Week 15	Assignments
Week 16	Projects

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- PRACTICAL MANUAL CLASSIFICATION OF INSECTS((Prof. Neerja Agrawal Emeritus Professor (ICAR) 2021)) 2-The Insects(An Outline of Entomology) P.J. Gullan and P.S. Cranston/ Department of Entomology, University of California, Davis, USA	No
Recommended Texts	- PRACTICAL MANUAL CLASSIFICATION OF INSECTS((Prof. Neerja Agrawal Emeritus Professor (ICAR) 2021))	No
Websites		

Grading Scheme

مخطط الدرجات

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biochemistry I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-215		
ECTS Credits	4.00		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	
Administering Department	Bio. Dept.	College	Meddle East university
Module Leader	Zainab Jabber Sabbur	e-mail	Zainab.J.S@muec.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Bio-102 General Chemistry	Semester	
Co-requisites module	Analytical chemistry , Organic chemistry	Semester	
Co-requisites module	Inorganic chemistry	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>The module objectives of Basic Biochemistry 1 may vary depending on the specific course or educational institution. However, here are some common objectives that are typically covered in a Basic Biochemistry 1 module:</p> <ol style="list-style-type: none">1. Introduction to Biochemistry: Understand the scope, importance, and basic principles of biochemistry as a scientific discipline.2. Structure and Function of Biomolecules: Explore the structure, properties, and functions of biomolecules, including proteins, carbohydrates, lipids, and nucleic acids.3. carbohydrate4. Protein Structure and Function: Learn about the primary, secondary, tertiary, and quaternary structure of proteins and the relationship between structure and function. Understand protein folding, enzymes, and enzyme kinetics.5. lipids.6. Enzymes.7. Hormones.8. Vitamins and Minerals. <p>These objectives provide a broad overview of the topics typically covered in a Basic Biochemistry 1 module, but the specific content and emphasis may vary from course to course.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>The outcomes of this modules are to have ability to understand the following subject:</p> <ol style="list-style-type: none">1. Carbohydrate Metabolism: Study the metabolism of carbohydrates, including glycolysis, gluconeogenesis, glycogen metabolism, and the regulation of blood sugar levels.2. Protein Structure and Function: Learn about the primary, secondary, tertiary, and quaternary structure of proteins and the relationship between structure and function. Understand protein folding, enzymes, and enzyme kinetics.3. Lipid Metabolism: Explore the metabolism of lipids, including fatty acid oxidation, lipogenesis, cholesterol metabolism, and the role of lipids in cellular membranes.4. Nucleic Acids and DNA Replication: Understand the structure and function of nucleic acids, including DNA and RNA. Learn about DNA replication, transcription, and translation.5. Bioenergetics and Metabolism: Gain an understanding of the principles of bioenergetics and the metabolism of major biomolecules. Learn about ATP production, oxidative phosphorylation, and the regulation of metabolism.5. Integration of Metabolic Pathways: Study the integration and coordination of different metabolic pathways in the cell. Understand how cells regulate metabolic processes to maintain homeostasis.6. Techniques in Biochemistry: Familiarize yourself with common laboratory techniques used in biochemistry, such as chromatography, electrophoresis,

	spectrophotometry, and molecular biology techniques. 7. Biochemical Techniques and Applications: Learn about the applications of biochemistry in various fields, including medicine, biotechnology, pharmacology, and environmental science.
<p>Indicative Contents</p> <p>مضمون المحتويات</p>	<p>Indicative content includes the following.</p> <p>The indicative contents of Basic Biochemistry may vary depending on the specific course or educational institution. However, here are some common topics and areas of study that are typically covered in a Basic Biochemistry course:</p> <ol style="list-style-type: none"> 1. Introduction to Biochemistry: <ul style="list-style-type: none"> - Definition and scope of biochemistry - Historical overview of biochemistry - Importance and applications of biochemistry 2. Biomolecules: <ul style="list-style-type: none"> - Structure, properties, and functions of proteins - Structure, properties, and functions of carbohydrates - Structure, properties, and functions of lipids - Structure, properties, and functions of nucleic acids 3. Protein Structure and Function: <ul style="list-style-type: none"> - Primary, secondary, tertiary, and quaternary structure of proteins - Protein folding and stability - Enzymes and enzyme kinetics - Regulation of enzyme activity 4. Carbohydrate classifications and reactions: 5. Enzymes 6. Hormones: 7. Vitamins and Minerals

<p>Learning and Teaching Strategies</p> <p>استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<p>Learning and teaching strategies in Basic Biochemistry aim to engage students in active learning, facilitate understanding of complex concepts, and develop critical thinking skills. Here are some common learning and teaching strategies employed in Basic Biochemistry courses:</p> <ol style="list-style-type: none"> 1. Lectures: Lectures are often used to deliver foundational knowledge and concepts in biochemistry. They provide an overview of the topics, explain key principles, and highlight important details. Lectures may be supplemented with visual aids, such as slides or multimedia presentations, to enhance understanding.

2. **Laboratory Work:** Laboratory sessions allow students to apply theoretical knowledge to practical situations. They provide hands-on experience with biochemical techniques, data collection, analysis, and interpretation. Lab work may involve experiments related to biomolecule analysis, enzyme kinetics, or metabolic pathways.
3. **Problem-solving Exercises:** Problem-solving exercises and case studies help students apply their knowledge to real-life scenarios. They encourage critical thinking and problem-solving skills by presenting biochemical problems or experimental data for analysis and interpretation. Students may work individually or in groups to find solutions and explain their reasoning.
4. **Interactive Discussions:** Interactive discussions, such as small group discussions or classroom debates, promote active learning and peer-to-peer interaction. They allow students to ask questions, clarify doubts, and engage in meaningful discussions about biochemical concepts, experiments, or applications.
5. **Concept Mapping:** Concept mapping is a visual learning tool that helps students organize and connect different biochemical concepts. It involves creating diagrams or mind maps that illustrate the relationships between different biomolecules, metabolic pathways, or cellular processes. Concept maps can aid in understanding the "big picture" and identifying the interconnections within biochemistry.
6. **Multimedia Resources:** Incorporating multimedia resources, such as videos, animations, and interactive simulations, can enhance students' engagement and understanding of complex biochemical processes. These resources can visually illustrate molecular structures, enzyme kinetics, or cellular processes, making them more accessible and memorable.
7. **Collaborative Learning:** Collaborative learning activities, such as group projects or problem-solving tasks, encourage students to work together to solve biochemical problems or complete assignments. This fosters teamwork, communication, and the exchange of ideas, allowing students to learn from each other's perspectives and experiences.
8. **Assessments:** Assessments, such as quizzes, exams, and assignments, evaluate students' understanding and knowledge retention. They provide feedback on individual progress and help identify areas that require further review or clarification. Assessments may include multiple-choice questions, problem-solving tasks, or short essay questions.
9. **Online Resources:** Utilizing online resources, such as virtual labs, interactive tutorials, or online discussion forums, can provide additional learning opportunities outside of the classroom. These resources offer flexibility and accessibility, allowing students to review content at their own pace and seek additional support when

needed.

10. Real-world Applications: Relating biochemistry concepts to real-world applications, such as medical advancements, biotechnology, or environmental issues, can enhance students' motivation and understanding. Exploring the practical relevance of biochemistry concepts helps students appreciate the significance of their learning and its impact in various fields.

These strategies aim to create an active and engaging learning environment that promotes understanding, critical thinking, and application of biochemistry principles. The specific strategies employed may vary based on the teaching style, course format, and resources available to the instructor.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
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
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Formative assessment	Quizzes	5	10% (10)	2,4,6,8,10, and 12	LO #1, #3,#5,#7,#9 and #11,
	Assignments	5	10% (10)	3,5,7,9,11, and 13	LO #2, #4 ,#6 and #8, #10,#12
	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	5	10% (10)	2,4,6,8,10	LO #3, #5,#7 and #9#11
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to biochemistry and living cells
Week 2	Introduction and principle of carbohydrates
Week 3	Classification of carbohydrates(monosaccharides, oligosacch., polysacch.)
Week 4	Diagnosis and reactions of carbohydrates
Week 5	Introduction and principle of Amino acids, peptides and proteins
Week 6	General properties, Classification and Diagnosis of amino acids
Week 7	General properties, Classification, Diagnosis and Determination of proteins.
Week 8	Mid-term Exam
Week 9	Introduction and principle of lipids

Week 10	General properties, Classification and Diagnosis of Lipids, Determination of lipids
Week 11	Discovery of enzymes, nomenclature, classification and characteristic of enzymes
Week 12	Mode of enzyme action, specificity of enzymes, Factors influencing enzyme activity, enzyme inhibition and chemotherapy.
Week 13	Introduction and principle of vitamin and coenzymes, Classification of vitamin
Week 14	Structure of nucleic acids, Classification of nucleic acid and DNA and RNA, Genetic code
Week 15	Diagnosis and determination of nucleic acids, Mutation and Genetic diseases, Central dogma
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Buffer and solutions preparations
Week 2	Molish test
Week 3	Fehling test
Week 4	Benedict test
Week 5	Ozason formation
Week 6	Iodine test and Unknown test
Week 7	Ninhydrin test and Xanthoproteic test
Week 8	Sakaguchi test
Week 9	Milon test
Week 10	Protein test
Week 11	Solubility test of lipids
Week 12	Saponification test
Week 13	Acrolein test
Week 14	Enzymes test
Week 15	Vitamin C test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biochemistry books: Biochemistry by L. Stryer Harper, Text Book of Medical Biochemistry Lippincott, Lehninger principle of biochemistry Color atlas of biochemistry Fundamental of biochemistry	Available Online
Recommended Texts	Color atlas of biochemistry	No
Websites	Any website	

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
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biochemistry II		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	Bio-225		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	
Administering Department	Bio. Dept.	College	Science
Module Leader	Zainab Jabber Subbar	e-mail	Zainab J.Subar@muec.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	None	e-mail	None
Peer Reviewer Name	None	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Bio-225 Biochemistry I	Semester	2
Co-requisites module	None	Semester	None

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Course objectives: Familiarizing students with the metabolism of basic life molecules in the body, such as carbohydrates, proteins, fats, and others, and how to represent them inside the body and convert them into vital energy that the human body invests in to perform various vital activities, such as growth and reproduction, for example.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Knowing the resulting imbalance in any of the food metabolism pathways and the consequent severe health damage to the body 2- Understanding the role that regulatory enzymes play in metabolic reactions. 3- Knowing the biological importance of food metabolism pathways and their fate in the body
Indicative Contents المحتويات الإرشادية	1-interactive teaching method (interactive lecture) 2 - Use the method of discussion and dialogue and ensure the involvement of students 3- The use of experimental education by combining theoretical lectures with the practical part 4- The use of educational technologies, modern programs and means of explanation in lectures, including the electronic classroom and other electronic platforms in electronic and blended education.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1 - The ability to understand the metabolic life processes that occur within the body 2 - Realizing the consequences of any dietary behavior that an individual follows during his life.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of metabolism.
Week 2	Carbohydrate metabolism / Absorption and digestion
Week 3	Glycolysis, Tricarboxylic acid cycle, pentose phosphate pathway, gluconeogenesis
Week 4	Glycogenesis and glycogenolysis, photosynthesis
Week 5	Disorder of carbohydrate metabolism.
Week 6	Lipids metabolism / Absorption and digestion
Week 7	Lipolysis, Beta-Oxidation of fatty acids, fatty acids Biosynthesis, Triacylglycerol
Week 8	Mid-term Exam.
Week 9	Cholesterol metabolism, ketone bodies metabolism, Disorder of Lipids metabolism.
Week 10	Amino acids and Proteins metabolism / Absorption and digestion
Week 11	Amino acids/biosynthesis of non-essential amino acid
Week 12	Biosynthesis of protein/Urea cycle, Disorder of amino acids and proteins metabolism.
Week 13	Metabolism of nucleic acids , Disorder of Lipids metabolism
Week 14	Mineral metabolism / Introduction, Calcium metabolism
Week 15	Sulphur metabolism, Copper metabolism, Selenium metabolism.
Week 16	Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction of clinical biochemistry
Week 2	Training students on blood drawing rules
Week 3	Training students on using devices in the laboratory.
Week 4	Determination Of serum Glucose.
Week 5	Determination of Lipids profile
Week 6	Determination Of serum uric acid.
Week 7	Determination Of serum MDA.
Week 8	Liver Functions test (part I)
Week 9	Liver Functions test (part II)
Week 10	Renal function test.(part I)
Week 11	Renal function test.(part II)
Week 12	Determination of serum proteins.
Week 13	Determination of Iron metabolism
Week 14	Determination of thyroid hormones
Week 15	Determination of parathyroid hormones

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biochemistry books: Biochemistry by L. Stryer Harper, Text Book of Medical Biochemistry Lippincott, Lehninger principle of biochemistry Color atlas of biochemistry Fundamental of biochemistry	Yes
Recommended Texts	Color atlas of biochemistry, CLINICAL BIOCHEMISTRY & METABOLIC MEDICINE by Crook	No
Websites	Any website	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Invertebrates		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-213		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Raneem Mohammed Abd Aljalel	e-mail	Ranem.mohammed@muec.edu.iq
Module Leader's Acad. Title	Assistant lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	NON	e-mail	
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 10. Realize the importance of Invertebrates 11. Understand the scope and principles of. Invertebrates 12. Recognize parasitic criteria, adaptations and requirements from their hosts. 13. Illustrate the main Invertebrates animals with their life cycles. 14. Realize the impact of parasites on human health and economy. 15. Define the scope and importance of immunology. 16. Recognize the principles and types of immunity. 17. Identify the mechanisms of immune response. 18. Discuss the disorders of the immune system and their pathogenic impacts
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> E. Knowledge and understanding <ol style="list-style-type: none"> 1 - Parasitology: - Demonstrate the taxonomic affiliation of specific parasitic examples. 2 - Discuss the adaptations of Invertebrates and their host specificity. 3 - Compare the life cycles of various parasites. F. mental skills <ol style="list-style-type: none"> 1-Dissect selected Invertebrates examples. 2 - Identify the economic and medical losses due to Invertebrates infections. 3 - Gain the practical skills of identifying, classifying and drawing Invertebrates examples. G. Professional skills <ol style="list-style-type: none"> 1 - Immunology: -Correlate the immune disorders with certain pathological manifestation. 2 - Discuss the relation of immunity with allergy and environmental factors H. General skills <ol style="list-style-type: none"> 1 - Show the risk factors autoimmunity and the acquired immunity defecancy syndrome (AIDS) et
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<ol style="list-style-type: none"> 1-Introducing Invertebrates 2-Medical veterinary and economic importance 3- Parasitic association, criteria and requirements 4- Invertebrates relationships. 5- Survery of various taxa of Invertebrates with life cycles of specific examples from: Protozoa-platyhelmenthes-nematodes-acanthocephala-arthropoda 6- Emphasis on local and human parasites with their distinctive features, impacts and control measures 7-Introducing immunology - Principles of immunology 8- Types of immunity - Specific and non specific 9- Innate and acquired - Tissue and humoral

	10- Active and passive 11- Antigen- antibody reaction 12- Immunity failure and diseases 13- Immunity and allergy 14- Immunity and transplantation. 15- Future prospects of immunology.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1 - Understanding parasitology as a term and its association in different fields. 2 - Identifying the stages of development of this topic and its achievements in various fields. 3 - Identify the most important techniques used to develop the ability to accurately diagnose parasites, develop the student's ability to describe and study parasites in different environments, and identify the classification keys to reach a knowledge of the genus and type of the parasite. 4 - Linking the theoretical information that the student had previously learned in the previous stages with its practical application in the laboratory.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	2,4,6,8,10, and 12	LO #1, #3,#5,#7,#9 and #11,
	Assignments	5	10% (10)	3,5,7,9,11, and 13	LO #2, #4 ,#6 and #8, #10,#12
	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	5	10% (10)	2,4,6,8,10	LO #3, #5,#7 and #9#11
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	General characteristics of Invertebrates
Week 2	Their benefits and harms Invertebrates environment
Week 3	Sexual reproduction of Invertebrates
Week 4	Asexual reproduction in Invertebrates
Week 5	Classification of Invertebrates
Week 6	Elementary Division
Week 7	Ciliate Division

Week 8	Division of Flatworms
Week 9	Phylum Sporoderms with a compound apex
Week 10	Cryptosporidium genus
Week 11	Condy's arcuate
Week 12	blood lace
Week 13	Imprtant of flagellate
Week 14	Nematodes
Week 15	Platyhelminthes
Week 16	Sarcodina

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction and characteristics of invertebrates harmful and benefits
Week 2	Lab 2: kingdom of the vanguard
Week 3	Lab 3: kingdom of the vanguard
Week 4	Lab 4: sponges and cnidarians
Week 5	Lab 5: Platyhelminthes and cyst worm
Week 6	Lab 6: Annelida
Week 7	Lab 7: - Arthropoda
Week 8	Lab 8:- Mosses and Mollusca

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	©2006 by Dawit Assafa, Ephrem Kibru, S. Nagesh,, Solomon Gebreselassie, Fetene Deribe, Jemal Ali	No
Recommended Texts	DT John - 2012 - books.google.com	No
Websites	2019Jan.16 [cited 2023Jun.14];29(2). Available from: http://journal.tishreen.edu.sy/index.php/hlthscnc/article/view/6465	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA-004		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Ayaa Abedl-rahman shukur	e-mail	Ayaa A.sh.@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	None	e-mail	None
Peer Reviewer Name	none	e-mail	None
Scientific Committee Approval Date	01/10/2025	Version Number	2.0

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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none">5. Its aim is to strengthen students' education in using English as a foreign language in order to help them enrich6. their knowledge and understanding of terms and phrases and strengthen their four skills (reading, writing and speaking).7. And listening).. Also, learning English helps them communicate with different people around the world.8. ☑ Teaching the student how to use English grammar in conversation9. ☑ Teaching students verbs (present and past as well as present continuous and past continuous) and the use of adjectives and adverbs and how to question using verbs and the use of question tools <p>☑ Introduce students to the rules, principles, concepts, vocabulary and meanings of the English language according to the prescribed curriculum.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">8. Students will increase their awareness of correct usage of English grammar in writing and speaking.9. Improve their speaking ability in English both in terms of fluency and comprehensibility.10. Receive feedback on their performance through oral presentations.11. Increase their reading speed and comprehension of academic articles.12. improve their reading fluency skills through extensive reading.13. Expand their vocabulary by keeping a vocabulary journal.14. strengthen their ability to write academic papers, essays and summaries using the process approach.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>The course aims to develop communicative competence in English for intercultural contexts by teaching language items and communicative strategies essential for such scenarios, while at the same time giving students ample chances to output such items. The aims of this course are reflected in the content, which contains several themes, such as cultural awareness, intercultural awareness and English as a global language. Indicative content includes understanding the uniqueness of your own culture and other cultures, as well as being aware of the role culture plays in communication in English as a global language. In addition, this course allows for discussions about what it means for English to be a global language of communication and how misunderstandings and miscommunications when using English occurs. The course also includes practice in the pronunciation features that help improve intelligibility in intercultural contexts, namely the Lingua Franca Core.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<ol style="list-style-type: none"> 1. Cultivate relationships Speaking with students to know each student, helps you understand who they are, where they come from and, perhaps, gain some insight into what teaching and learning styles are most effective for them. 2. Teach language skills across all curriculum topics 3. Speak slowly and be patient: Speaking in a slower, measured cadence Being a bit more aware of your pronunciation 4. Prioritize “productive language” 5. Using a variety of methods to engage learning 6. Using visual aids by the use of pictures, diagrams, charts and other visual tools. 7. Coordinate with the ESL teacher: Such discussions can yield insights into individual students and their learning styles or challenges; they can also be helpful for sharing information about curriculum topics, potentially providing ESL teachers with ideas for highly relevant vocabulary words that can reinforce academic lessons. 8. Pre-teach new vocabulary words that may be unfamiliar to ELLs, or even to give them a copy of the article or link to the material ahead of time. 9. Build in some group work. 10. Respect moments of silence: Many new language learners tend to be a little reticent and quiet, opting for silence over speaking up and saying something “wrong” in a language that is still unfamiliar. Research-based strategies for differentiating instruction to promote student learning
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	Continues	LO #1, #2 and #10, #11
	Assignments	5	10% (10)	Continues	LO #3, #4 and #6, #7
	Projects / Lab.	1	10 % (10)	13	
	Essays	2	10% (10)	7-13	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	Unit 1 Getting to know you
Week 2	Unit 2 The way we live
Week 3	Unit 3 It all went wrong
Week 4	Unit 4 Let's go shopping!
Week 5	Unit 5 What do you want to do?
Week 6	Unit 6 Tell me! What's it like?
Week 7	Mid-term Exam

Week 8	Unit 7 Fame
Week 9	Unit 8 Do's and don'ts
Week 10	Unit 9 Going places
Week 11	Unit 10 Scared to death
Week 12	Unit 11 Things that changed the world
Week 13	Unit 12 Dreams and reality
Week 14	Unit 13 Earning a living
Week 15	Oral-term Exam
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Headway. Beginner. Student's Book by Liz and John Soars, 2019.	Yes
Recommended Texts		No
Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	(Arabic language II) 2 اللغة العربية 2		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA-002		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Middle East
Module Leader	Alaa Abdl-Muhsin	e-mail	Alaa M.@meuc.edu.iq
Module Leader's Acad. Title	Lect.	Module Leader's Qualification	Ph.D
Module Tutor	none	e-mail	None
Peer Reviewer Name	none	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>أ - تنمية معارف الطلبة للغة العربية، وأهميتها لهم. ب - أن يتعرف على شرح بعض سور القرآن الكريم، ويحفظها. ت- ان يتعرف الطالب على تاريخ الأدب، وأهم مراحل تطوره . ث- الاطلاع على شعراء لم يسبق للطلاب التعرف عليهم ج- أن يضبط الطلبة كتابة الأملاء وعلامات الترقيم.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>1. القدرة على الحفظ والاستذكار 2. القدرة على الموازنة بين لغة ادب العصر المذكور والآداب الأخرى. 3. القدرة على المشاركة الجماعية للمحتويات الأدبية للمادة 4. القدرة على تقديم المقترحات وحل المشكلات 5. القدرة على التفاعل مع المصادر والمراجع</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>القران الكريم- سورة الملك ، الآيات 1-10 ، القواعد، المبتدأ والخبر الأدب- مصطلح الأدب والعصور الأدبية الإملاء- كتاب الهمة القران الكريم- سورة الملك الآيات 11-20 القواعد- كان وأخواتها الأدب- قصيدة قم للمعلم لأحمد شوقي الإملاء- كتابة الضاد والطاء القران الكريم- سورة الملك الآيات 21-30 القواعد- إن وأخواتها الأدب- قصيدة اللغة العربية لحافظ إبراهيم الإملاء- علامات الترقيم القواعد- التوابع الأدب- النثر العربي، المقامات الأدبية</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>تعتبر استراتيجيات التراكيب عن قواعد تراكيب اللغة العربية، حيث أن أفضل أسلوب في تدريس القواعد النحوية، وهو الأسلوب الطبيعي الذي يعتمد على ممارسة اللغة استماعاً، وكلاماً، وقراءة، وكتابة، وعلى هذا الأساس فالاستعمال كما يقول ابن خلدون: ومحاكاة الأساليب اللغوية الصحيحة، والتدريب عليها تدريجياً متصلاً، هو الأسلوب الأمثل في تدريس القواعد النحوية، ومن ثم لا بد أن يفسح المدرس أمام التلاميذ المجال في دروس الاستماع، والتعبير والقراءة للتدريب على القواعد النحوية، حيث يشعرون بحاجتهم إليها للفهم والتعبير والكتابة</p>
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دون ضغط أو إرغام. إضافة الى:

- 6 - استراتيجيات الحوار
- 7 - استراتيجيات السرد القصصي
- 8 - التدريس باستخدام التكنولوجيا
- 9 - استراتيجيات إعداد المشاريع...
- 10 - استراتيجيات تبادل الأدوار

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	33	Structured SWL (h/w)	2
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)	50		
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	2 to 12	LO #1, #2 and #10, #11
	Assignments	5	10% (10)	2 to 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)		
	Essays	2	10% (10)	6,13	LO #5, #8 and #10

Summative assessment	Midterm Exam	1hr	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	القران الكريم- سورة الملك (الآيات 1-10)
Week 2	القواعد- المبتدأ والخبر
Week 3	الأدب- مصطلح الأدب والعصور الأدبية
Week 4	الإملاء- كتاب الهمزة
Week 5	القران الكريم- سورة الملك (الآيات 11-20)
Week 6	القواعد- كان وأخواتها
Week 7	first-term Exam
Week 8	الأدب- قصيدة قم للمعلم لأحمد شوقي
Week 9	الإملاء- كتابة الضاد والطاء
Week 10	القران الكريم- سورة الملك (الآيات 21-30)
Week 11	القواعد- إن وأخواتها
Week 12	الأدب- قصيدة اللغة العربية لحافظ إبراهيم
Week 13	الأدب- النثر العربي، المقامات الأدبية
Week 14	الإملاء- علامات الترقيم
Week 15	القواعد- التوابع
Week 16	final-term Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	كتاب اللغة العربية للأقسام غير الاختصاص	Yes
Recommended Texts	كتب اخرى ضمن الاختصاص ذات اسلوب أكاديمي مفصل	Yes
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Plants groups		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-216		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Osama Qasim abdlameer	e-mail	Osama qasim@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 10. Identify the different types of plants groups and distinguish between vascular and non-vascular plants. 11. Study of cyanophyta and eukaryotic algae and their role in the environment. 12. Understanding the life cycles of algae, their types, and distinguishing between different generations of the same algae 13. Identify the different algae parts and their modifications 14. Study the mechanisms of sexual and asexual reproduction in different algae groups.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Identify the most important plant groups and species in nature, their characteristics, and methods of reproduction and living. 2. Methods of feeding various plant groups (algae, ferns, mosses), their sexual and asexual reproduction, growth, nutritional needs, and methods of producing spores. 3. Knowing the most important functions that take place at the different tissues. 4. Know its different types 5. Understanding the mechanisms of sexual and asexual reproduction in different divisions 6. Identify the most important events that take place during the life cycle. 7. Microscopic examination of many samples from different places 8. Learn to prepare slides for various samples.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>plants Groups course covers four main themes:</p> <p>Importance: study of its importance from various medical, economic, agricultural, and environmental aspects.</p> <p>Classification: Dividing algae into groups according to the degree of similarity between them in genetic components and morphology</p> <p>External morphology: Studying the external structure of algae and its various parts</p> <p>Their nutrition and life cycles: Learn about the methods of nutrition for different types of algae, as well as their life cycles in different forms.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical</p>
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classes designed to introduce you to plants groups. At the same time, refining and expanding their critical thinking skills through topics covered in lectures include what are algae, their basic characteristics, nutrition, and life cycle. An interactive tutorial and by considering types of simple experiments In methods of preparing slides, identifying the shapes of algae, and observing some important phenomena in the in the reproductive stage.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	5	10% (10)	2,4,6,8,10, and 12	LO #1, #3,#5,#7,#9 and #11,
	Assignments	5	10% (10)	3,5,7,9,11, and 13	LO #2, #4 ,#6 and #8, #10,#12
	Projects	1	10% (10)	Continuous	All
	Report/ Lab.	5	10% (10)	2,4,6,8,10	LO #3, #5,#7 and #9#11
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Algae, their importance, presence, nutrition, Forms of algae
Week 2	Reproduction in algae, growth in algae, life cycle of algae, classification of algae
Week 3	Cyanophyta
Week 4	Chlorophyta
Week 5	Chlorophyta
Week 6	Euglenophyta
Week 7	Mid-term Exam
Week 8	Chrysophyta
Week 9	Phaeophyta
Week 10	Phaeophyta
Week 11	Pyrrophyta
Week 12	Rhodophyta
Week 13	Mosses
Week 14	Ferns
Week 15	Seed plants
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to algae, methods of isolating them, the most important laboratory equipment, and sterilization methods
Week 2	Shapes of algae and spores.
Week 3	Shapes of algal colonies and aggregations
Week 4	Project

Week 5	Cyanophyta slides
Week 6	Chlorophyta slides
Week 7	Midterm exam
Week 8	Euglenophyta slides
Week 9	Chrysophyta slides
Week 10	Phaeophyta slides
Week 11	Pyrrophyta slides
12	Collect samples from ponds and prepare slides with diagnosis
13	Rhodophyta slides
14	Project Discussion

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<p>-Freshwater Algae of North America (Second edition) Ecology and Classification Aquatic Ecology 2015, Pages 459-483</p> <p>-Al-Kandari, M.; Al-Yamani, F. and Al-Rifaie, k. (2009). Marine phytoplankton atlas of Kuwait's waters. Kuwait Institute for Scientific Research, P.O. Box, 2488, 13109, Kuwait.</p> <p>-Desikachary, t. V. (1959). Cyanophyta Indian. Council of Agricultural Research, New Delhi, India.</p> <p>-Komárková, Jarka; Jezberová, Jitka; Komárek, Ondřej; Zapomělová, Eliška (2010). "Variability of Chroococcus (Cyanobacteria) morphospecies with regard to phylogenetic relationships". Hydrobiologia. 639: 69–83.</p>	No
Recommended Texts		No
Websites	<p>-https://www.britannica.com</p> <p>-https://www.vcbio.science.ru.nl/en/virtuallessons/redalgae</p> <p>- http://micro.magnet.fsu.edu/featuredmicroscopist/vanegmond/chroococcussmall.html</p>	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	جرائم حزب البعث		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	UOA006		
ECTS Credits	2		
SWL (hr/sem)	30		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Law
Module Leader	Ayaa Hassan Turki	e-mail	Ayaa Hassan@meuc.edu.iq
Module Leader's Acad. Title	Assist Lecturer	Module Leader's Qualification	MSc
Module Tutor	none	e-mail	None
Peer Reviewer Name	none	e-mail	None
Scientific Committee Approval Date	01/06/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>1. لتعرف على الأحكام القانونية الرئيسية التي تحكم ملاحقة الجرائم بموجب قانون محكمة الجنايات العليا العراقية لعام 2005.</p> <p>تحليل الآثار النفسية على الأفراد والمجتمعات المتأثرة بجرائم نظام البعث.</p> <p>دراسة الآثار الاجتماعية لسياسات وأفعال نظام البعث على المجتمع العراقي.</p> <p>تقييم أبرز الانتهاكات التي ارتكبتها نظام البعث، مع التركيز على تأثيرها على حقوق الإنسان.</p> <p>تقييم الأضرار البيئية الناجمة عن نظام البعث في العراق وتأثيرها على الصحة العامة.</p> <p>التحقيق في السياق التاريخي وأهمية القبور الجماعية كدليل على الجرائم المرتكبة خلال عصر البعث.</p> <p>فهم دور القانون الدولي في معالجة جرائم نظام البعث وضمان المساءلة.</p> <p>استكشاف آليات العدالة الانتقالية وأهميتها في التعامل مع إرث فظائع نظام البعث.</p> <p>تعزيز الوعي والفهم بجرائم نظام البعث وتأثيراتها المستمرة على المجتمع العراقي.</p> <p>المساهمة في الحوار حول انتهاكات حقوق الإنسان والعدالة التاريخية في العراق ما بعد نظام البعث.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>أظهار فهماً شاملاً للإطار القانوني المتعلق بملاحقة الجرائم بموجب قانون محكمة الجنايات العليا العراقية لعام - 2005.</p> <p>تحليل الأثر النفسي للفظائع التاريخية على الأفراد والمجتمعات في سياق نظام البعث في العراق.</p> <p>تقييم الآثار الاجتماعية لسياسات وأفعال نظام البعث، وتأثيراتها المستمرة على المجتمع العراقي بنقد بناء.</p> <p>تقييم تأثير انتهاكات حقوق الإنسان الجسيمة التي ارتكبت خلال نظام البعث على النسيج السياسي والاجتماعي الأوسع في العراق.</p> <p>تقييم العواقب البيئية لأفعال نظام البعث في العراق، مع التركيز على فهم التأثيرات على الموارد الطبيعية والصحة العامة.</p> <p>تفسير الأهمية التاريخية للقبور الجماعية كدليل على الجرائم المرتكبة خلال عصر البعث في العراق.</p> <p>معرفة بآليات القانون الدولي لتقييم مساءلة نظام البعث عن جرائمه بموجب القانون الدولي.</p> <p>تحليل فعالية آليات العدالة الانتقالية في التعامل مع ما خلفه انتهاكات حقوق الإنسان خلال نظام البعث.</p> <p>تقييم التأثير السياسي والاجتماعي والثقافي لجرائم نظام البعث في تشكيل المجتمع والسياسة العراقية المعاصرة.</p> <p>ابن حجاً مستندة لتوضيح ضرورة العدالة التاريخية وتعزيز حقوق الإنسان في مرحلة ما بعد عصر البعث في العراق.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>مفهوم الجرائم واقسامها , تعريف الجريمة لغة واصطلاحاً, جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 م , أنواع الجرائم الدولية, الجرائم النفسية, اليات الجرائم النفسية, الجرائم الاجتماعية, موقف المظالم البعثي من الدين, انتهاكات القوانين العراقية, الجرائم البيئية لنظام البعث في العراق, التلوث الحربي والاشعاعي وانفجار الألغام, تجفيف الازهار, جرائم المقابر الجماعية, احداث مقابر الإبادة الجماعية, التصنيف الزمني لمقابر الإبادة الجماعية.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<p>Strategies</p>	<p>القاء المحاضرات، استخدام طريقة النقاش والحوار، العصف الذهني، الاختبارات . السريعة</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	التعريف بمفهوم الجريمة وانواعها
Week 2	التعريف بالأنظمة السياسية العراقية منذ عام 1921- 2003
Week 3	أنواع الجرائم الدولية
Week 4	انتهاكات النظام السابق للحقوق والحريات العامة
Week 5	أنواع الجرائم المرتكبة من قبل النظام السابق على المستوى الوطني
Week 6	الجرائم النفسية والاجتماعية
Week 7	الجرائم السياسية والثقافية
Week 8	الجرائم السياسية والثقافية
Week 9	انتهاك الحقوق والحريات وحصر السلطات الثلاث من قبل حزب البعث المنحل
Week 10	أنواع الجرائم المرتكبة من قبل النظام السابق على المستوى الدولي
Week 11	المرحلة الانتقالية في العراق ما بعد عام 2003
Week 12	اثر المرحلة الانتقالية في محاربة السياسة الاستبدادية لحزب البعث المنحل
Week 13	اثار الجرائم النفسية والاجتماعية على المجتمع العراقي
Week 14	مفهوم العدالة الانتقالية وآليات تحقيقها في العراق
Week 15	اثر سياسات حزب البعث المنحل على البيئة
Week 16	final-term Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		NO
Recommended Texts		No

Websites	
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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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المواد الدراسية

للمستوى الثالث

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Animal Physiology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-323		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Rasha Mohmmmed Ali	e-mail	Rasha.M.A@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>1- provide students with a basic understanding of the fundamental processes and mechanisms that serve and control the various functions of the body.</p> <p>2-It should be noted that, although introductory, this course in Animal Physiology is comprehensive in scope. Areas treated in detail include both relatively simple cellular mechanisms as well as more complex interactions between whole organ systems.</p> <p>3-The major areas of study include excitable tissues, muscle, blood, the cardiovascular system and neurophysiology. primary literature to develop the ability to think critically about issues in animal physiology and write about those in an effective manner.</p> <p>4- To learn to properly and safely use animals and modern laboratory equipment to conduct research.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. have an enhanced knowledge and appreciation of mammalian physiology. 2. understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems. 3. understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail. 4. be able to perform, analyses and report on experiments and observations in physiology. 5. be able to recognize and identify principal tissue structures. 6. Identify the mechanisms of neuromuscular coordination and the mechanics of homeostasis. 7. Distinguish between types of endocrine glands by location, composition and hormone production. 8. Knowledge of the most important hormonal disorders that occur in the organism, their causes and health symptoms. 9. Understanding the physiology of reproduction and the stages of sexual maturity in both sexes
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part (1)</p> <p>Introduction of physiology:</p> <p>Definition of physiology and its most important branches and its relationship to other sciences and basic principles in knowing the functions of organs and ways to maintain homeostasis[4 hrs]</p> <p>Cellular level of organization:</p> <p>Components of the cell: cytoplasm and nuclear organelles.[4 hrs]</p> <p>Cell membrane: structure & function, mechanisms of membrane transport and cell to cell communication.[4 hrs]</p> <p>Systems:</p>

	<p>Nervous system and the special senses: Structure, function and physiology of the central and peripheral nervous system and the special senses; vision, hearing, taste, smell and touch.[2hrs]</p> <p>Cardiovascular, Respiratory and Urinary Systems: Structure, function and integrated physiology of the tissues and organs of these systems, Endocrine system, Muscles, their types and mechanism of action[12 hrs]</p> <p>Lactation: Mammary gland development, structure and regulation of milk production</p> <p>Reproductive physiology. The physiology of thermoregulation[4 hrs]</p>
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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 types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Animal physiology
Week 2	Cellular level of organization
Week 3	Cardiovascular System Blood and lymph
Week 4	blood and lymph
Week 5	Nervous system and the special senses
Week 6	Nervous system and the special senses
Week 7	Muscular System (Histology and Physiology)
Week 8	Respiratory System
Week 9	Urinary System
Week 10	Digestive system

Week 11	The physiology of thermoregulation
Week 12	Functional Organization of the endocrine system.
Week 13	endocrine Glands
Week 14	endocrine Glands
Week 15	Reproductive System
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Osmotic Relationships
Week 2	Lab 2: Determination of blood hemoglobin and hematocrit (PCV)
Week 3	Lab 3: Hemocytometry (Blood cell count)
Week 4	Lab 4: Blood Coagulation (Hemostasis), Clotting Time Test (C.T.)+Bleeding Count (B.T.)
Week 5	Lab 5: Determination of blood groups and measurement of blood pressure
Week 6	Lab 6: Determination of blood glucose
Week 7	Lab 7: Determination of bilirubin

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	VanPutte, C. L., Regan, J. L., & Russo, A. F. (2021). Seeley's essentials of anatomy & physiology. McGraw-Hill.	Yes
Recommended Texts	Hall, J. E., & Hall, M. E. (2020). Guyton and Hall textbook of medical physiology e-Book. Elsevier Health Sciences.	No
Websites	https://byjus.com/biology/human-body-anatomy/	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Cell Biology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-311		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Shahad Waddah Nasrat	e-mail	Shahad.wadhah@mec.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1. Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles2. Students will understand how these cellular components are used to generate and utilize energy in cells3. Students will understand the cellular components underlying mitotic cell division.4. Students will apply their knowledge of cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>Students will acquire knowledge on the Cell Biology subject by establishing an interactive framework. The main learning objective is to reach a comprehensive understanding of the structure and function of the cell and its organelles and to familiarise with different basic techniques currently used in Cell Biology. At the end of this course, all the students should be able to:</p> <ol style="list-style-type: none">1. Know and understand cell morphology2. ultrastructure and function3. cell cycle and proliferation4. Understanding the cellular membrane system and the mechanisms of transport of substances across membranes5. Understanding the energy release pathway in the mitochondrial organelle6. Types of endoplasmic reticulum and their functions7. Study of plastids and their types and understand the process of photosynthesis8. Learn about the structure and function of chromosomes9. Identify the genetic material and types of nucleic acids10. Understanding the mechanisms and stages of cell division
Indicative Contents المحتويات الإرشادية	<p>Defining the cell, its types, shapes and sizes, and understanding the most important differences between single-celled organisms and multicellular organisms, and between animal and plant cells [4 hrs.]</p> <p>Components of the cell: cytoplasm and nuclear organelles.</p> <p>Cell membrane: structure & function, mechanisms of membrane transport and cell to cell communication. [4 hrs.]</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>Study of cellular organelles in terms of structure and function, represented by the smooth and rough endoplasmic reticulum, the Golgi apparatus, and the vacuoles [4 hrs.]</p> <p>Studying the structure and function of mitochondria and their membrane systems and their role in cellular respiration and energy production. In addition to studying the plastids and their types in the plant cell and the steps of the photosynthesis process that occur inside them and the study of Golgi bodies and lysosomes [8 hrs.]</p> <p>Part c- Cytoskeleton (Microtubules, microfilaments and intermediate filaments) Tubulin and actin, Cilia, flagella and microtubules [4 hrs.]</p> <p>Nucleus, nucleolus, chromosomes, and protein synthesis process (2 hrs.)</p> <p>cell cycle and cell division (4 hrs.)</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	common properties of cells
Week 2	Prokaryotes vs. eukaryotes
Week 3	cell chemistry
Week 4	cellular membranes
Week 5	cellular organelles
Week 6	Endoplasmic reticulum
Week 7	Mitochondria
Week 8	Lysosomes
Week 9	Plastids

Week 10	Colgi apparatus and vacuoles
Week 11	The nucleus and the nucleolus
Week 12	Chromosomes
Week 13	Cellular division
Week 14	Cytoskeleton (Microtubules, microfilaments and intermediate filaments)
Week 15	Ribosomes and protein synthesis
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab 1: Lab safety, Types of microscopes and their parts
Week 2	Lab 2: Slides ready to identify the types and shapes of cells
Week 3	Lab 3: Prepare temporary slides for cell samples
Week 4	Lab 4: Slides prepared for cell organelles .
Week 5	Lab 5: Slides prepared for cell organelles
Week 6	Lab 6: Slides prepared for cell organelles
Week 7	Lab 7: Slides prepared for cell organelles

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Pollard, T. D., Earnshaw, W. C., Lippincott-Schwartz, J., & Johnson, G. (2022). Cell biology E-book. Elsevier Health Sciences.	No
Recommended Texts	Hall, J. E., & Hall, M. E. (2020). Guyton and Hall textbook of medical physiology e-Book. Elsevier Health Sciences.	No
Websites	https://www.britannica.com/science/cell-biology	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Ecology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-322		
ECTS Credits	5		
SWL (hr/sem)	79		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farid Mushib Mahdi	e-mail	Farid.m.mahdi@meuc.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ol style="list-style-type: none">1. Introduce students to the fundamental concepts and terminology of ecology.2. Explain the interactions between living organisms and their environments.3. Understand the role of biotic and abiotic factors in shaping ecosystems.4. Study the impact of human activities on the environment and natural resources.5. Develop scientific skills for analyzing environmental problems and proposing solutions.6. Promote environmental awareness and responsibility for protecting ecosystems.7. Learn strategies for sustainability and biodiversity conservation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Explain the fundamental concepts and terminology of ecology.2. Analyze the interactions between organisms and their biotic and abiotic environments.3. Evaluate the impact of human activities on ecosystems and natural resources.4. Apply scientific methods to study environmental problems and propose appropriate solutions.5. Use environmental data to prepare scientific reports and analyses.6. Demonstrate environmental awareness and responsibility in daily and professional practices.7. Propose strategies for biodiversity conservation and achieving environmental sustainability.
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none">1. Introduction to Ecology Define ecology, its history, and explain why it is essential to understand nature and human life.2. Basic Concepts Describe ecosystems and their components; differentiate between biotic (living) and abiotic (non-living) factors.3. Interactions Among Organisms Explain how organisms obtain food (food chains/webs) and how they relate (mutualism, predation, competition).4. Biogeochemical Cycles Present the movement of essential materials like water, carbon, and nitrogen in nature and their role in life continuity.5. Biodiversity and Geographic Distribution Explain the levels of biodiversity (genes, species, ecosystems) and factors determining where organisms live.6. Population Ecology Study changes in population numbers over time and the factors increasing or decreasing them.

	<p>7. Environmental Changes Discuss climate change, habitat loss, and their effects on ecosystems.</p> <p>8. Human Activities and the Environment Present forms of pollution (air, water, soil) and resource depletion caused by human activities.</p> <p>9. Sustainability and Conservation Explain smart environmental management methods and strategies for conserving biodiversity for future generations.</p> <p>10. Applied Projects or Case Studies Provide practical training on analyzing a local environmental issue or writing a short scientific report.</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The strategy combines theoretical and practical approaches to ensure deep understanding of ecological concepts and develop analytical and problem-solving skills. Key methods include:</p> <ol style="list-style-type: none"> 1. Interactive Lectures <ul style="list-style-type: none"> – Present core concepts and theories while encouraging questions and discussions. 2. Student Presentations <ul style="list-style-type: none"> – Assign specific ecological topics to enhance research and presentation skills. 3. Laboratory or Field Work <ul style="list-style-type: none"> – Conduct experiments or field trips to observe ecosystems in practice. 4. Project-Based Learning <ul style="list-style-type: none"> – Develop small-scale environmental projects or analyze local case studies. 5. Collaborative Learning <ul style="list-style-type: none"> – Organize students into groups to work on activities or solve environmental problems. 6. Class Discussions and Case Studies <ul style="list-style-type: none"> – Analyze real-world environmental issues and derive practical solutions. 7. E-learning and Open Resources <ul style="list-style-type: none"> – Use videos, articles, and online simulations to support self-directed learning.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction in Ecology
Week 2	Ecosystem
Week 3	Physico-chemical Environmental Parameters
Week 4	Wind & Atmospheric Pressure & Humidity
Week 5	Hydrologic Cycle
Week 6	Biogeochemical Cycles
Week 7	Cycle Sycles
Week 8	Energy Flow in Ecosystem
Week 9	Habitat & Ecological Niche
Week 10	Population
Week 11	Survivorship Curves
Week 12	Community
Week 13	Ecological Succession
Week 14	Ecological Interactions
Week 15	Negative Ecological Interactions
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Controls for understanding and using environmental laboratories
Week 2	Lab 2: Environmental factors
Week 3	Lab 3: Temperature

Week 4	Lab 4: Humidity
Week 5	Lab 5: Light & Precipitation
Week 6	Lab 6: Dew point & current flow
Week 7	Lab 7: Chemical factors: pH & E.C
Week 8	Lab 8: DO & BOD
Week 9	Lab 9: Density
Week 10	Lab 10: Tools and methods for collecting organisms
Week 11	Lab 11: Ecological sampling
Week 12	Lab 12: Soil
Week 13	Lab 13: Soil type
Week 14	Lab 14: Vegetation study
Week 15	Lab 15: Population Estimation
Week 16	Get the lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Ecology, Hussein Saadi.	Yes
Recommended Texts	1. Al Saadi, H. A. (2006). Principles of Ecology and Environment. Al-Yazori publisher, Amman-Jordan. 2. WHO. (World Health Organization). (1996). Guideline for drinking water quality. Health & Criteria and other supporting information. 2nd edition. Geneva.	No
Websites	https://www.sciencedirect.com	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Genetics		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	Bio-321			
ECTS Credits				
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		6
Administering Department	Bio	College	Meddle east	
Module Leader	Alhan Hashim sheat		e-mail	Alhan. H.s.@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ms.c.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	none	e-mail	None	
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	Basic and scientific understanding of genetics, study of the factors that helped in the development of genetics, the relationship of heredity with Other sciences, experiments in genetics, applications of genetics at the present time
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	It defines the necessary knowledge in genetics and its applications in various aspects of life and the role of scientists in the development of this science.
Indicative Contents المحتويات الإرشادية	A-2 Knowing the relationship between this science with other sciences B - The soft skills objectives of the course. B-1 Understanding the method of analyzing chromosomes and genes and diagnosing chromosomal variations B-2 Understanding the genetic causes of diseases B - 3 Using modern methods in diagnosing genetic disease

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Using scientific references and direct meeting with students through an electronic lecture ... and strengthening skills The process is for the student by showing scientific explanatory films and videos
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
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Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 genetic
Week 2	Mendelian inheritance
Week 3	Law applications Mendel I
Week 4	Law applications

	Mendel II
Week 5	Genes and their role in Transfer of genetic traits
Week 6	genetic material in the reality of nuclear
Week 7	genetic material in unreal beings Nucleus
Week 8	first month exam
Week 9	specify the gender
Week 10	clan inheritance
Week 11	some applications on clan inheritance
Week 12	Cellular division
Week 13	Mutation
Week 14	Cancer inheritance
Week 15	Cancer inheritance
Week 16	second month exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Drosophila insect
Week 2	Lab 2: Drosophila insect collection and reproduction
Week 3	Lab 3: mutation
Week 4	Lab 4 chromosomal aberration
Week 5	Lab 5: drosophila chromosomes
Week 6	Lab 6: Genetic Disease
Week 7	Lab 7: Isolation of chromosomes from the salivary gland of Drosophila insect

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	General Genetics book written by: Dr. Abdul Hussein Al-Faisal	No
Recommended Texts	Series of Genetic Diseases (Inheritance, its pros and cons) by Dr. Sheikh Salem Al-Areed Genetics book authored by Dr. Makram Diaa Genetics and plant diseases, authored by: Prof. Dr.. Khalifa Abdel Maqsoud Zayed, Prof. Dr. Kawthar Saad Qash	No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Histology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-313		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Rasha Mohammed Ali	e-mail	Rasha.M.A.@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	-none
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>15. This class discusses the fundamental aspects of histology.</p> <p>16. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>17. Highlights the general morphology, genetic structure, function of tissues as.</p> <p>18. Science aims to know the structure of the body.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>25. Discuss reasons for studying tissues; explain how the body composed of organs, tissues and cells.</p> <p>26. Learn the shapes of the four main tissues of the body.</p> <p>27. Describe the shape of the different organs of the body and how the tissue within each organ works.</p> <p>28. Know how each tissue of the body is diagnosed.</p> <p>29. A full description of all body systems and what organs they contain.</p> <p>30. Describe the types and structure of blood and lymphatic vessels and the heart.</p> <p>31. Description of the digestive, urinary, reproductive, and respiratory systems, the skin and its appendages, lymphatic organs, endocrine glands, and special sense: the eye and the ear.</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Nervous system [2 hrs]</p> <p>a- Neurons, neuroglia.</p> <p>b- Nerve fibers, nerve trunk, and synapses.</p> <p>c- Sympathetic & parasympathetic system.</p> <p>d- Meninges, spinal cord.</p> <p>e- Cerebrum, cerebellum.</p> <p>Hematopoiesis system [2 hrs]</p> <p>a- Red and yellow bone marrow, maturation & erythrocytes maturation & granulocyte.</p> <p>b- Maturation & lymphocytes & monocytes, origin of platelets</p> <p>Circulatory system [2 hrs]</p> <p>a- General structure & blood vessels, general structure, types & capillaries.</p> <p>b- General structures & different types & arteries.</p> <p>c- General structure & different types & veins, general structure & heart</p> <p>Lymphoid system [2 hrs]</p> <p>a- Cellular & humoral immunity, antigen & antibody, differentiation T & B-</p> <p>b- lymphocytes.</p> <p>c- Thymus, lymph node.</p> <p>d- Spleen, tonsil, encapsulated lymphoid.</p> <p>Digestive system [2 hrs]</p> <p>a- General structure & digestive tract, lip.</p> <p>b- Pharynx, esophagus, cardiac & pyloric parts & stomach.</p> <p>c- Parts & small intestine (duodenum, jejunum & ileum).</p>

	<p>d- Colon, rectum, appendix.</p> <p>e- Salivary gland (parotid gland - sublingual gland & submaxillary gland).</p> <p>f- Liver.</p> <p>g- Pancreas, gall bladder</p> <p>Respiratory system [2 hrs]</p> <p>a- Nasal cavity, paranasal sinuses, nasopharynx.</p> <p>b- Larynx, trachea, bronchial tree.</p> <p>c- Pulmonary blood vessels, nerves, pleura & lung</p> <p>Integumentary system [2 hrs]</p> <p>a- Epidermis.</p> <p>b- Dermis, subcutaneous layer.</p> <p>c- Hair, nails.</p> <p>d- Glands & skin, vessels & nerves & the skin</p> <p>Urinary system [2 hrs]</p> <p>A- Nephron.</p> <p>b- Collecting tubule & ducts, juxtaglomerular apparatus.</p> <p>c- Blood circulation, bladder & ureter.</p> <p>Reproductive system [2 hrs]</p> <p>a- Testis, intratesticular genital ducts.</p> <p>b- Excretory genital duct, accessory genital gland, penis.</p> <p>c- Ovary, oviduct.</p> <p>d- Uterus, mammary gland.</p> <p>Endocrine system [2 hrs]</p> <p>a- Pituitary gland.</p> <p>b- Adrenal gland.</p> <p>c- Thyroid gland, parathyroid gland, pineal body.</p> <p>Sense organs [2 hrs]</p> <p>Receptors related to somatic & visceral sensitivity, proprioceptor system, and chemoreceptors.</p> <p>b- The eye.</p> <p>c- The ear</p>
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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 as well as a series of lectures and practical
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classes designed to introduce you to histology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are tissues, their basic characteristics, structure, classification, and function. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic histological techniques. These activities are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative	Midterm Exam	2hr	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 course
Week 2	Nervous system
Week 3	Hematopoiesis system
Week 4	Circulatory system
Week 5	Lymphoid system
Week 6	Digestive system
Week 7	First month Exam
Week 8	Respiratory system
Week 9	Integumentary system
Week 10	Urinary system
Week 11	Reproductive system
Week 12	Endocrine system
Week 13	Sense organs
Week 14	Full review
Week 15	second month exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	<p style="text-align: center;">Hematopoiesis system</p> Human blood smear, RBCS, Platelets & WBCs
Week 2	<p style="text-align: center;">Circulatory system</p> Heart, Arteries, Veins, capillaries & Lymphatic vessels
Week 3	<p style="text-align: center;">Lymphoid system</p> Palatine tonsil, lymph node, thymus, & spleen
Week 4	<p style="text-align: center;">Digestive system</p> Esophagus, Stomach, small & large intestine, liver, gall bladder & pancreas
Week 5	<p style="text-align: center;">Respiratory system</p> Larynx, Trachea, & lung
Week 6	<p style="text-align: center;">Integumentary system</p> Epidermis, dermis, hair, & sweat gland
Week 7	<p style="text-align: center;">Urinary system</p> Kidney: cortex& medulla, ureter, urinary bladder.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Mescher. A. L. (2013). <i>Jonquiere's Basic Histology Text and Atlas</i> . MC Graw Hill. 13 rd edition.	No
Recommended Texts	GARTNER L. P. and HIATT J. L. (2014). <i>Color Atlas and Text of Histology</i> . Sixth Edition. Crystal Taylor.	No

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Immunology		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	Bio-325			
ECTS Credits	6			
SWL (hr/sem)	125			
Module Level	3	Semester of Delivery		6
Administering Department	Bio	College	Meddle east	
Module Leader	Shahad Waddah Nasrat		e-mail	Shahad. Wadhah @meuc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/10/2025		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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>19. Studying the characteristics of the immune system and knowing its unique properties in defending the body against diseases through the unique characteristics of the immune response</p> <p>20. Knowledge of the organs, tissues and cells of the immune system and their distinctive role in the process of maturation and differentiation of immune cells</p> <p>21. Knowing the types of immune cells and their functions in the work of the immune system, in addition to the nature of their work in regulating the immune response</p> <p>22. Obtaining sufficient information about the nature of the antigen and what are the conditions that must be met in the antigen for an immune response against it</p> <p>23. Knowledge of diseases caused by the immune system (autoimmune diseases)</p> <p>24. Knowing the types of vaccines and how to alert the immune system about diseases</p> <p>25. The role of the immune system in organ transplantation</p> <p>26. Identification of tumor immunity</p> <p>27. Learn about the types of allergic reactions</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <p>32. Discuss the reasons for studying immunology. explain how the immune system differs from other body systems; Define the term "immunology".</p> <p>33. Outlines for the functioning of the immune system through its resistance to various diseases.</p> <p>34. Describe the methods of activating the immune system through the different pathways for entry of antigens into the body.</p> <p>35. The role of cells and the organs of the immune system in the work and regulation of the body's immune function.</p> <p>36. Explain the classification of immunity through its instinctive presence in the body or through its appearance as a result of infection with various infectious diseases.</p> <p>37. Knowledge of diseases caused by the immune system.</p> <p>38. How does the immune system fight tumors?</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Introduction and general concepts of immunology</u></p> <p>Knowledge of specialized and non-specialized defense mechanisms, in addition to the unique characteristics and stages of the immune response. (2hr)</p>

Cells and Tissues of the Immune System

The fully developed immune system of humans and most mammalians is constituted by a variety of cells and tissues whose different functions are remarkably well integrated. Among the cells, the lymphocytes play the key roles in the control and regulation of immune responses as well as in the recognition of infected or heterologous cells, which the lymphocytes can recognize as undesirable and promptly eliminate. Among the tissues, the thymus is the site of differentiation for T lymphocytes, and as such, is directly involved in critical steps in the differentiation of the immune system.(4hr)

Knowing the types of antigens and how the immune system deals with each type, knowing the chemical composition of an antigen and the conditions that must be met in order for it to be considered an antigen [2 hrs]

Innate immunity, what is meant by it, what is its role in the structure and function of the immune system, and what are the defensive lines of innate immunity? [4 hrs]

Learn about the immunity classification scheme, what are its types, and what is the specialty of each type in resisting different diseases_[4 hrs]

Recognize the specialization of each of the two defensive lines that make up the instinctive immunity(4hr)

Identifying one of the important immune mechanisms that prepares the mechanism of the complement system, what is its benefit to the body, what are the ways to activate it, and how it is sometimes a cause of some diseases of the body. [4 hrs].

Learn about the composition and types of antibodies and what is the function of each type (4hr)

Identifying the main types of immunity in addition to instinctive immunity, which is humoral immunity and cellular immunity, and the role of each of them in addressing internal and external cellular antigens (4 hr)

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 and a series of lectures and practical classes designed to introduce you to immunology. At the same time refine and expand their critical thinking skills through topics covered in lectures include what are immunity, their basic characteristics, structure, classification, propagation, and quantification.

An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic immunological techniques including blood groups . serological tests and ELISA technique .

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and general concepts
Week 2	Cells and tissue of the immune system
Week 3	Antigen and innate immunity
Week 4	innate immunity part-2
Week 5	Complement system
Week 6	Antibody structure and functions
Week 7	Mid-term Exam
Week 8	Specific immunity (humoral immunity part-1)
Week 9	Humoral immunity part-2
Week 10	Specific immunity (cellular immunity-1)
Week 11	cellular immunity part-2
Week 12	Hypersensitivity reactions
Week 13	Auto immune diseases
Week 14	Tumor immunity
Week 15	Vaccines
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction in practical immunology

Week 2	Lab 2: blood groups tests
Week 3	Lab 3: RF test
Week 4	Lab 4: CRP test
Week 5	Lab 5: Widal test
Week 6	Lab 6: Rose Bengal test
Week 7	Lab 7: ELISA and immunofluorescence

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Kuby immunology by Judith A. Owen Haverford College Jenni Punt Haverford College Sharon A. Stranford Mount Holyoke College with contributions by Patricia P. Jones Stanford University	No
Recommended Texts	Basic IMMUNOLOGY FUNCTIONS AND DISORDERS OF THE IMMUNE SYSTEM by Abul K. Abbas, MBBS Professor Emeritus, Pathology University of California San Francisco San Francisco, California	No

	<p>Andrew H. Lichtman, MD, PhD Professor of Pathology Harvard Medical School Brigham and Women's Hospital Boston, Massachusetts</p> <p>Shiv Pillai, MBBS, PhD Professor of Medicine and Health Sciences and Technology Harvard Medical School Massachusetts General Hospital Boston, Massachusetts</p>	
Websites	https://www.youtube.com/results?search_query=signals+of+b-lymphocyte+activation	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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Fail Group (0 - 49)	FX - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				معلومات المادة الدراسية			
Module Title	Microbial Physiology			Module Delivery			
Module Type	Core			<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar			
Module Code	Bio-326						
ECTS Credits	5						
SWL (hr/sem)	125						
Module Level	3	Semester of Delivery					
Administering Department	Bio		College	Meddle east			
Module Leader	Dania Abdlkreem Ali		e-mail	Dania.A.A.@meuc.edu.iq			
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	Ms.c.			
Module Tutor	Name (if available)		e-mail	E-mail			
Peer Reviewer Name	Name		e-mail	E-mail			
Scientific Committee Approval Date	01/10/2025		Version Number	1.0			

Relation with other Modules				العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	General Microbiology			Semester			
Co-requisites module	None			Semester			

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	<p>28. Introduction to the principles of microbial physiology as part of Biology</p> <p>29. Introducing students to the difference between eukaryotic and prokaryotic microorganisms</p> <p>30. Knowledge of bacterial cellular structures and their functions</p> <p>31. Familiarity with aspects of microorganisms' nutrition and methods of obtaining energy.</p> <p>32. Studying bacterial growth and learning methods for its estimation and calculation.</p> <p>33. Understanding the mechanisms of catabolic and structural metabolism in bacterial cells</p>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>A. Knowledge and understanding: Familiarity with the scientific basics related to the physiology and metabolism of microorganisms and identification of the methods used to calculate microbial growth</p> <p>B. Subject-specific skills:</p> <p>39. Understanding and getting used to the basic ideas contained within the various facts that the student is exposed to in practice and how these ideas are related.</p> <p>40. Establishing a strong and solid foundation for microbial physiology.</p> <p>41. The ability to read relevant research and scientific literature.</p>
Indicative Contents المحتويات الإرشادية	<p>lectures, tutorials, workshops, set readings. Two-hour lecture per week (total 28 hours). The tutorial will consist of a set questions put to the students to informally assess their understanding of the content of the lecture, to allow them to think about and solve example problems related to the lecture content, to express their understanding in English, and to correct any misunderstanding or gaps in their knowledge of the lecture's content.]</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical classes designed to introduce you to microbial physiology. At the same time, they are</p>
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refining and expanding their critical thinking skills through topics covered in lectures, including what microorganisms are, their basic characteristics, structure, classification, nutrition, and metabolism. An interactive tutorial and by considering types of simple experiments (practical classes) offer training in basic microbiology techniques, including isolation, response toward different environmental conditions, death point measurement, and their sensitivity to antimicrobial agents. These activities are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All

	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 microbiology physiology
Week 2	Classification of microorganisms (eukaryotes and prokaryotes)
Week 3	Eubacteria and archaea
Week 4	Structure and function of a bacterial cell
Week 5	Nutrition and growth
Week 6	Bacterial growth stages
Week 7	Regulation of metabolism in bacteria
Week 8	Mid-term Exam
Week 9	respiration and fermentation
Week 10	Krebs cycle and glycolysis
Week 11	Oxidative phosphorylation and electron transport
Week 12	Structures and eukaryotic functions
Week 13	Differentiate between the physiology of eukaryotic and prokaryotic microbes
Week 14	Control of microbial growth
Week 15	Types of antibiotics and their effect
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Estimation of microbial growth
Week 2	Lab 2: The effect of environmental factors on microbial growth
Week 3	Lab 3: Estimation of cell death rate due to high temperature
Week 4	Lab 4: The effect of pH on microbial growth
Week 5	Lab 5: Effect of osmotic pressure on microbial growth
Week 6	Lab 6: antimicrobial agents
Week 7	Lab 7: microbial enzymes
Week 8	Lab 8: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	السعد، مها رؤوف. مبادئ فسلجة الأحياء المجهرية. دار الكتب للطباعة والنشر. جامعة الموصل، العراق. 1982.	Yes
Recommended Texts	Moat, A.G. J.; Foster, W. and Spector M.P. Microbial Physiology, 4th Edition, John Wiley & Sons, Inc., Publications, New York, USA. 2002. Kim, B.H. and Gadd G.M. Bacterial Physiology and Metabolism. Cambridge University Press, New York, USA. 2008. Watson, D. Microbiology and Microbial Physiology. White Word Publications, New York, USA. 2018.	No
Websites	https://www.uoanbar.edu.iq/staff-page.php?ID=1336	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Microbiology of soil and water		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-422		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Dania Abdreem Ali	e-mail	Dania.A.A@meuc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	none	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>34. This class discusses the fundamental aspects of microbiology of soil and water .</p> <p>35. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>36. Highlights the role of the different microorganisms found in soil and water and their different relationships with each other and with the environmental conditions in which they live..</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>42. Knowledge and Understanding: The university student will be introduced to the most important microorganisms found in soil and water.</p> <p>43. Subject-specific skills: At the first university level, the student acquires the ability to distinguish between different organisms and their ways of living in soil and water.</p> <p>44. Methods of teaching and learning: It is a direct explanation with students through graphics and a Power Point presentation, in addition to educational videos on the subject.</p> <p>45. Assessment methods: daily exams (cozzes), monthly exams, reports on the subject in addition to final exams.</p> <p>46. Thinking skills: The student in the bachelor's degree acquires the ability to distinguish between living organisms, their types, distribution, and the importance of their presence in the soil.</p> <p>47. General and transferable skills (other skills related to employability and personal development).</p> <p>48. Gaining scientific knowledge and the ability to diagnose bacteria, fungi and protozoa from the environment in which they live</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Soil Microbiology: It is the branch of science/ microbiology concerned with soil-inhabiting microorganisms, their functions, and activities.</p> <p>Soil is one of the world's most important natural resources. Together with air and water, it is the basis for life on planet earth. Soil can be defined as a thin layer of material covering the earth's surface and is formed from the interactions between five factors called soil forming factors includes topography of the land, the organisms present in the environment, the climate, the parent material, and the time.</p> <p>Soil texture and soil structure</p> <p>Soil texture and soil structure are both unique properties of the soil that have a profound effect on the behavior of soil, such as water holding capacity, nutrient retention and supply, drainage, and nutrient leaching.</p> <p>Soil texture is one of the most important physical properties of soil. Soil texture is the proportion of sand, silt, and clay particles that make up soil, these particles are distinguished</p>

solely by size. Table.1 illustrated soil particles size.

The texture of the soil is important because it determines soil characteristics that affect plant growth, from these characteristics are water-holding capacity, permeability and soil workability

Types of soil

1. Sandy Soil

Has a large particle size. This soil is known as the poorest type of soil for agriculture and growing plants as they have very low nutritional value and poor water holding capacity.

2.Silt Soil

It is known to have much smaller particles compared to sandy soil and is made up of rock and other mineral particles, which are smaller than sand and larger than clay. It is the smooth and fine quality of the soil that holds water better than sand. The silt soil is more fertile compared to the other three types of soil. Therefore, it is also used in agricultural practices to improve soil fertility.

3.Clay Soil

Is mainly composed of the smallest particles of soil, which are densely packed with very little, or no airspace and they effectively retain water. This soil is not suitable for growing plants as it is harder for moisture and air to penetrate the soil.

4.Loamy Soil

It is a combination of sand, silt and clay such that the beneficial properties from each are included. It can retain moisture and nutrients; hence, it is more suitable for farming. This soil is also referred to as agricultural soil.

Textural triangle

Textural class a grouping of soils based upon the relative proportion of sand, clay and silt. Soil with the finest texture is called clay soil, while soil with the coarsest texture is called sands.

However, a soil that has a relatively even mixture of sand, silt, and clay and exhibits the properties from each separate is called loam.

There are different types of loams, based upon which soil separate is most abundantly present. the textural triangle used to determine the soil type

Soil structure: is the arrangement of the soil particles into aggregates of various sizes and shapes. Aggregates that occur naturally in the soil are referred to as peds.

Good structure is important as it allows air movement through the soil. Soil air and water are vital for healthy plant growth and nutrient supply.

Soil composition

The basic components of soil are minerals, organic matter, water and air. The typical soil consists of approximately 45% mineral, 5% organic matter, 25% water, and 25 % air. **(Figure. 4).** Good healthy soil has sufficient air, water, minerals and organic material

to promote and sustain plantlife.

- **Inorganic materials**

In most soil types of inorganic materials (mineral particles) represent about 45% of total soil volume. The inorganic material of soil is composed of rock, slowly broken down by weathering and biogeochemical factors into smaller particles that vary in size. Soil particles that are 0.005 to 2 mm indiameter are sand. Soil particles between 0.002 and 0.05 mm are called silt, and even smaller particles, less than 0.002 mm in diameter, are called clay. Some soils have no dominant particle size, containing a mixture of sand, silt, and humus; these soils are called loams.

Based on its chemical nature the mineral portion of soil can be divided into twogroups:

- 1- Silicate minerals**

Minerals are composed of silicate groups. They are the largest and most important class of minerals and makeup approximately 90 % of Earth's crust, quartz is the most common silicateminerals.

- 2- Non – Silicate minerals**

Minerals that are not composed of silicate groups. Makeup only 10% of Earth's crust such as copper,silver and gold.

- **Water and Air**

Soil particles pack loosely, forming a soil structure filled with pore spaces, these pores contain soil solution (water) and gas (air). Water and air in soil vary significantly with soil texture, weather, and plant uptake of water, but their percentage together in most of the soil types is about 50 % of total soil volume.

- **Soil water:**

Comes from rain, snow, dew and irrigation. Soil water serves as a solvent and a carrier of nutrients for plant growth. The microorganisms inhabiting the soil also require water for their metabolic activities. Percentage of soil – water is about 25 % total volume of soil

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The main strategy that will be adopted in delivering this unit is to encourage students to participate in exercises as well as a series of lectures and practical classes designed to introduce you to microbiology. At the same time refine and broaden critical thinking skills through topics covered in the lectures including what microbiology of soil and water are, their prevalence and quantification. An interactive educational program through looking at the types of simple experiments (practical classes) provides training in basic techniques including isolation of pathogenic bacteria, fungi

and diagnosis their . These activities are fun for the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 of Soil Microbiology
Week 2	Soil Microorganisms
Week 3	Soil Bacteria
Week 4	Some factors affecting the growth and reproduction of soil bacteria:
Week 5	The carbon cycle and its relationship to soil microbes:
Week 6	pesticides:
Week 7	Exam
Week 8	<i>Nitrogen cycle and its relationship to soil microbes:</i>
Week 9	Aquatic Microbiology
Week 10	Biological factors of the aquatic environment and their impact on microorganisms
Week 11	Drinking water:
Week 12	Exam
Week 13	Biological Wastewater Treatment
Week 14	factors that affect the self-purification of water
Week 15	Preparatory week before the final Exam
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Disinfection and sterilization in laboratories
Week 2	Lab 2: culture media
Week 3	Lab 3: microbiology of soil and water
Week 4	Lab 4: Isolation of Molds
Week 5	Lab 5: Isolation of yeasts
Week 6	Lab 6: Starch degradation by bacterial isolates from the soil
Week 7	Lab 7: Counting and observing cellulose-degrading microbes in the soil
Week8	Lab 8: nitrogen fixation
Week9	Lab9: Winogradsky

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ol style="list-style-type: none"> 1. Wood, Martin. Soil Biology. New York: Chapman and Hall, 1989. Print 2. ^ <i>Vieira (2020). "Bacterial colonization of minerals in grassland soils is selective and highly dynamic". Environmental Microbiology. 22 (3): 917–933. doi:10.1111/1462-2920.14751. PMID 31325219</i> 	Yes
Recommended Texts	<ol style="list-style-type: none"> 1. Wood, Martin. Soil Biology. New York: Chapman and Hall, 1989. Print 2. ^ <i>Vieira (2020). "Bacterial colonization of minerals in grassland soils is selective and highly dynamic". Environmental Microbiology. 22 (3): 917–933. doi:10.1111/1462-2920.14751. PMID 31325219</i> 	Yes
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mycology I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-324		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Alhan Hashim Sheat	e-mail	Alhan.H.S.@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>37. This class discusses the fundamental aspects of mycology.</p> <p>38. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>39. Highlights the general morphology, genetic structure, function of fungi as a vital starting point for knowledge of fungus diseases and gene transfer technology.</p> <p>40. Underlie the principles and application of fungal technology in pharmaceutical, and biomedical fields.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>49. Discuss reasons for studying fungi; explain how fungi differ from other organisms; define the term 'fungi'.</p> <p>50. Outline methods for cultivation of fungi; purification of fungi; detection of fungi and their components</p> <p>51. Describe the mechanisms of fungal growth .</p> <p>52. Explain the basis of the shapes, sizes and colors of the reproductive units, especially the spores, vary and conidia with a variety of fungal species .</p> <p>53. Describe the fungi that cause disease for human ,animal, inscta and plant..</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Part A – fungal structure, classification, and nomenclature replication:</u></p> <p>Introduction to fungal structure. History of fungal. Fungi (singular Fungus) are known as thallic organisms(Eukaryotic) Fungi are of great importance due to their close association with all aspects of life, which made it of great importance to study these</p> <p>The group of organisms, identifying them and studying their characteristics, highlighting the importance of studying fungi for the role they play in fungi</p> <p>human life positively or negatively. Complex organic compounds as energy and carbon sources. Fungi share some other features with fungi. Their cell walls are made of chitin, which is found in the exoskeletons of arthropods.Fungi produce a number of pigments, including melanin, which is also found in the hair and skin of animals. Like In animals, fungi also store carbohydrates as glycogen. [8 hrs]</p> <p>Most fungi grow on agar dextros potato medium (PDA) This medium is nutritionally rich and encourages the growth of mycelium at the expense of sporulation.It is replaced with weak media such as (CMA) medium (agar meal corn) because it contains more accessible carbohydrates. Cellulose-decomposing and food-destroying fungi retain their ability to produce cellulose enzyme cellulase When using weak media and to encourage the formation of blackboards, pieces of paper or dung are added to it .Animals or pieces of filter papers or seeds, depending on the type of mushroom.It is difficult to isolate fungi from infected tissues or soil infested soils or from decaying materials due to the rapid spread of fungi, bacteria and actinomycetes</p>

which includes antagonism . [4 hrs]

Part B – fungal groups

fungi reproduce sexually. However, Imperfecti Fungi or Deuteromycetes lack sexual reproduction. There are usually two phases in the life cycle of fungi.

The two metaphases are the haploid, which has an odd number of chromosomes chromosomes (n_1) and diploid, which has a diploid number of Chromosomes in the nucleus (n_2) and gametes are usually haploid (n_1) produced after the process of diploid nuclear fusion from the chromosomal set (n_2) as in Sexual spores such as oospores, zygosporangia, and so on. and produces Monophase ($1n$) again in the life cycle of the fungus through the process of meiosis (meiosis) The number of chromosomes in the nucleus will be bisected . [2 hrs]

Symbiosis interactions or symbioses between fungi and other organisms fall within a range wide range of categories. In some cases, coexistence is obligatory (symbiosis obligate). Necessary for life (but it affects its host negatively, which leads to death.

The pathogens and parasites get the ingredients for their life from the host It affects her family negatively, which leads to her death. The difference between parasites and pathogens is that the pathogens. They cause disease, while parasites do so only in rare cases. Commensal relationships benefit one partner, but do not harm the other. And there are fungi ,It enters into mutualistic relationships that benefit from it and benefit the other (the breadwinner). Therefore, besides the intrusive and restorative fungi, there are species that live with other plants living Symbiotic, they either live with some algae to form lichens, or with plant roots. The fungus (Micorrhiza) is in symbiotic relationships . [4 hrs]

The term metabolitesim secondary covers a wide range of processes Metabolites that have no relationship except that they are all activated when the growth of the fungus stops in one way or another In other words, when fungi grow on suitable environments, they carry out food metabolism and produce compounds Metabolism is described as secondary, when growth stops, using glucose in a small amount cases. The primary metabolites are those intermediate compounds produced as a result of food metabolism during the growth process. The secondary metabolites of fungi are bioactive compounds, most of which are toxic to humans ,Animal, plant, and microorganisms are therefore called Mycotoxins when they are present Toxic to humans and animals, while those that are toxic to plants are called Phytotoxins and a group of compounds Toxic to microorganisms, it is called Antibiotic. So far, nearly 1000 compounds have been known Metabolic compounds, which are the result of more than 1000 secondary metabolic reactions that differ in their structure in a way Large in chemical composition, and each reaction is specific to each species or type of fungus . [4 hrs]

Types of Spores and their shapes: The shapes, sizes and colors of the reproductive units,

especially the spores, vary, The conidia differ in the diversity of fungal taxa, and such diversity is noted in Deuteromycetes imperfect fungi in particular which may be Their spores are single-celled, or yeast-like, and multiply By donating. The majority of fungi reproduce by mycelia, which may be A type of mycelium, a cystic fungus containing a septum with a simple hole or

Basidiomycosis of the type of mycelia, in which the hole is of the type dolipore and mycelium with canine connections. despite the existence of Multiple ways for fungi to multiply, but the formation of blackboards is one of the most important Chlamydo spores are formed by the transformation of one of the cells The vegetative layer of the fungal hyphae or a group of these cells is round and thickened The wall, and this type of blackboard does not spread, but is liberated when the thread is dissolved Fungal form chlamydial spores, which may form peripheral As for the conidia, they are formed on specialized cells that are not part of the site or its middle Vegetative mycelium. [2 hrs]

Fungal growth mechanisms is approximately 50-100 microns in length of the hypha. The elongation is in the mycelium By the top of the Haifa, that is, the growth is apical. The more mature parts of the fungal hyphae are unable to Rather, it plays an important role in supporting growth by forming new protoplasm and transporting it by flow cytoplasm to the developing apex. So Gow & Goody stated in 1990 that life in fungi is At their tops, this means that the intercalary growth that occurs in plants does not occur in fungi

In fungi, growth occurs in a space that does not exceed half a micron in length and is called a zone dilation. zone extension, which is full of vesicles and devoid of existing organelles in other regions of the fungus. Vesicles are of two types: Micro vesicles

Their size is less than 100 microns, and other large macro vesicles are more than 100 microns. The follicles are clustered in Spitzenkorper clusters, which are observed for the first time Once by researcher Brunswik in 1924 and the large vesicle Macro vesicles are

Vesicles secretory contains enzymes to build and break down the wall in the process of growth. [4 hrs]

Types of mycotoxins: Mycotoxins are classified on the basis of their sources of synthesis into five main groups:A group of amino acids. such as Pcsilocybin and Ergotamine and the rest of the alkaloids, Fusaric acid and Penicillin. It is a heterogeneous group.It is a mycotoxin, due to its origin from different organic acids , A group of phenolic and aromatic toxins, which are synthesized in a manner.Polyketides They are part of a large group of mycotoxins that create one such methodThe second will be mentioned later in Paragraph (3), and among these types of toxins are Aflatoxins Zearalenones and Griseofulvin. And Shikmic acid method for the synthesis of aromatic amino acids.It is the second way to synthesize a group of aromatic and phenolic toxins.This route contains xanthocillin and cumarins. [2 hrs]

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 as well as a series of lectures and practical classes designed to introduce you to mycology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are fungi, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic fungal techniques including the isolation, diagnosis and classification of a pathogenic fungi. These activities are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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
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Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 course
Week 2	Introduction taxonomy of fungi
Week 3	Myxomycetes
Week 4	Mastigomycotina
Week 5	Diplomastigomycotina
Week 6	Amastigomycotina
Week 7	Mid-term Exam
Week 8	Zygomycotina
Week 9	Ascomycotina
Week 10	Hemiascomycotina
Week 11	Basidiomycotina
Week 12	Oomycotina
Week 13	Types of disease caused by fungi
Week 14	Dermatophytes
Week 15	Cutaneous mycoses
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of fungal diagnoses
Week 2	Lab 2: Methods of sterilization and culture media for growing fungi
Week 3	Lab 3: Slide preparation
Week 4	Lab 4: Isolation and cultivation of fungi
Week 5	Lab 5: Chemical factors , Factors affecting fungal growth
Week 6	Lab 6: Preservation of fungi
Week 7	Lab 7: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Alexopoulos . G . J . 1962 . Introductory mycology . John Wiley & sons Inc . N . Y . Bonnie H. Ownley Robert N. Trigiano . 2017. Plant Pathology Concepts and Laboratory Exercises .3ed . ed . CRC Press Taylor & Francis Group . Boca Raton London New York.	No
Recommended Texts	Volk . J . Thomas .1994 . The fungi . Academic press. - M. Peraica, B. RadicÂ , A. LucicÂ , & M. PavlovicÂ . 1999. Toxic effects of mycotoxins in humans . Bulletin of the World Health Organization.	No
Websites	https://www.youtube.com/watch?v= 6oLUAnSoOE	

<https://www.youtube.com/watch?v=6kT7vLbuX9U>

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mycology I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-314		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Alhan Hashim Sheat	e-mail	Alhan.H.S.@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>41. This class discusses the fundamental aspects of mycology.</p> <p>42. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>43. Highlights the general morphology, genetic structure, function of fungi as a vital starting point for knowledge of fungus diseases and gene transfer technology.</p> <p>44. Underlie the principles and application of fungial technology in pharmaceutical, and biomedical fields.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>54. Discuss reasons for studying fungi; explain how fungi differ from other organisms; define the term 'fungi'.</p> <p>55. Outline methods for cultivation of fungi; purification of fungi; detection of fungi and their components</p> <p>56. Describe the mechanisms of fungal growth .</p> <p>57. Explain the basis of the shapes, sizes and colors of the reproductive units, especially the spores, vary and conidia with a variety of fungal species .</p> <p>58. Describe the fungi that cause disease for human ,animal, inscta and plant..</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Part A – fungal structure, classification, and nomenclature replication:</u></p> <p>Introduction to fungal structure. History of fungal. Fungi (singular Fungus) are known as thallic organisms(Eukaryotic) Fungi are of great importance due to their close association with all aspects of life, which made it of great importance to study these</p> <p>The group of organisms, identifying them and studying their characteristics, highlighting the importance of studying fungi for the role they play in fungi</p> <p>human life positively or negatively. Complex organic compounds as energy and carbon sources. Fungi share some other features with fungi. Their cell walls are made of chitin, which is found in the exoskeletons of arthropods.Fungi produce a number of pigments, including melanin, which is also found in the hair and skin of animals. Like In animals, fungi also store carbohydrates as glycogen. [8 hrs]</p> <p>Most fungi grow on agar dextros potato medium (PDA) This medium is nutritionally rich and encourages the growth of mycelium at the expense of sporulation.It is replaced with weak media such as (CMA) medium (agar meal corn) because it contains more accessible carbohydrates. Cellulose-decomposing and food-destroying fungi retain their ability to produce cellulose enzyme cellulase When using weak media and to encourage the formation of blackboards, pieces of paper or dung are added to it .Animals or pieces of filter papers or seeds, depending on the type of mushroom.It is difficult to isolate fungi from infected tissues or soil infested soils or from decaying materials due to the rapid spread of fungi, bacteria and actinomycetes</p>

which includes antagonism . [4 hrs]

Part B – fungal groups

fungi reproduce sexually. However, Imperfecti Fungi or Deuteromycetes lack sexual reproduction. There are usually two phases in the life cycle of fungi.

The two metaphases are the haploid, which has an odd number of chromosomes chromosomes (n_1) and diploid, which has a diploid number of Chromosomes in the nucleus (n_2) and gametes are usually haploid (n_1) produced after the process of diploid nuclear fusion from the chromosomal set (n_2) as in Sexual spores such as oospores, zygosporangia, and so on. and produces Monophase ($1n$) again in the life cycle of the fungus through the process of meiosis (meiosis) The number of chromosomes in the nucleus will be bisected . [2 hrs]

Symbiosis interactions or symbioses between fungi and other organisms fall within a range wide range of categories. In some cases, coexistence is obligatory (symbiosis obligate). Necessary for life (but it affects its host negatively, which leads to death.

The pathogens and parasites get the ingredients for their life from the host It affects her family negatively, which leads to her death. The difference between parasites and pathogens is that the pathogens. They cause disease, while parasites do so only in rare cases. Commensal relationships benefit one partner, but do not harm the other. And there are fungi ,It enters into mutualistic relationships that benefit from it and benefit the other (the breadwinner). Therefore, besides the intrusive and restorative fungi, there are species that live with other plants living Symbiotic, they either live with some algae to form lichens, or with plant roots. The fungus (Micorrhiza) is in symbiotic relationships . [4 hrs]

The term metabolitesim secondary covers a wide range of processes Metabolites that have no relationship except that they are all activated when the growth of the fungus stops in one way or another In other words, when fungi grow on suitable environments, they carry out food metabolism and produce compounds Metabolism is described as secondary, when growth stops, using glucose in a small amount cases. The primary metabolites are those intermediate compounds produced as a result of food metabolism during the growth process. The secondary metabolites of fungi are bioactive compounds, most of which are toxic to humans ,Animal, plant, and microorganisms are therefore called Mycotoxins when they are present Toxic to humans and animals, while those that are toxic to plants are called Phytotoxins and a group of compounds Toxic to microorganisms, it is called Antibiotic. So far, nearly 1000 compounds have been known Metabolic compounds, which are the result of more than 1000 secondary metabolic reactions that differ in their structure in a way Large in chemical composition, and each reaction is specific to each species or type of fungus . [4 hrs]

Types of Spores and their shapes: The shapes, sizes and colors of the reproductive units,

especially the spores, vary, The conidia differ in the diversity of fungal taxa, and such diversity is noted in Deuteromycetes imperfect fungi in particular which may be Their spores are single-celled, or yeast-like, and multiply By donating. The majority of fungi reproduce by mycelia, which may be A type of mycelium, a cystic fungus containing a septum with a simple hole or Basidiomycosis of the type of mycelia, in which the hole is of the type dolipore and mycelium with canine connections. despite the existence of Multiple ways for fungi to multiply, but the formation of blackboards is one of the most important Chlamydo spores are formed by the transformation of one of the cells The vegetative layer of the fungal hyphae or a group of these cells is round and thickened The wall, and this type of blackboard does not spread, but is liberated when the thread is dissolved Fungal form chlamydial spores, which may form peripheral As for the conidia, they are formed on specialized cells that are not part of the site or its middle Vegetative mycelium. [2 hrs]

Fungal growth mechanisms is approximately 50-100 microns in length of the hypha. The elongation is in the mycelium By the top of the Haifa, that is, the growth is apical. The more mature parts of the fungal hyphae are unable to Rather, it plays an important role in supporting growth by forming new protoplasm and transporting it by flow cytoplasm to the developing apex. So Gow & Goody stated in 1990 that life in fungi is At their tops, this means that the intercalary growth that occurs in plants does not occur in fungi

In fungi, growth occurs in a space that does not exceed half a micron in length and is called a zone dilation. zone extension, which is full of vesicles and devoid of existing organelles in other regions of the fungus. Vesicles are of two types: Micro vesicles

Their size is less than 100 microns, and other large macro vesicles are more than 100 microns. The follicles are clustered in Spitzenkorper clusters, which are observed for the first time Once by researcher Brunswik in 1924 and the large vesicle Macro vesicles are

Vesicles secretory contains enzymes to build and break down the wall in the process of growth. [4 hrs]

Types of mycotoxins: Mycotoxins are classified on the basis of their sources of synthesis into five main groups: A group of amino acids. such as Pcsilocybin and Ergotamine and the rest of the alkaloids, Fusaric acid and Penicillin. It is a heterogeneous group. It is a mycotoxin, due to its origin from different organic acids , A group of phenolic and aromatic toxins, which are synthesized in a manner. Polyketides They are part of a large group of mycotoxins that create one such method The second will be mentioned later in Paragraph (3), and among these types of toxins are Aflatoxins Zearalenones and Griseofulvin. And Shikmic acid method for the synthesis of aromatic amino acids. It is the second way to synthesize a group of aromatic and phenolic toxins. This route contains xanthocillin and cumarins. [2 hrs]

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 as well as a series of lectures and practical classes designed to introduce you to mycology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are fungi, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic fungal techniques including the isolation, diagnosis and classification of a pathogenic fungi. These activities are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

assessment	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 course
Week 2	Introduction of fungi
Week 3	Natural habitat of fungi
Week 4	Reproduction in fungi
Week 5	Fungal growth mechanisms
Week 6	Shapes and types of spores
Week 7	Mid-term Exam
Week 8	Sexual Reproduction in fungi
Week 9	Secondary Metabolism
Week 10	Toxines of fungi
Week 11	Relationships between fungi and other microorganism
Week 12	Medical mycology
Week 13	Types of disease caused by fungi
Week 14	Dermatophytes
Week 15	Cutaneous mycoses
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of fungal diagnoses
Week 2	Lab 2: Methods of sterilization and culture media for growing fungi
Week 3	Lab 3: Slide preparation
Week 4	Lab 4: Isolation and cultivation of fungi
Week 5	Lab 5: Chemical factors , Factors affecting fungal growth
Week 6	Lab 6: Preservation of fungi
Week 7	Lab 7: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Alexopoulos . G . J . 1962 . Introductory mycology . John Wiley & sons Inc. N . Y. Bonnie H. Ownley Robert N. Trigiano . 2017. Plant Pathology Concepts and Laboratory Exercises .3ed . ed . CRC Press Taylor & Francis Group . Boca Raton London New York.	No
Recommended Texts	Volk . J . Thomas .1994 . The fungi . Academic press. - M. Peraica, B. RadicÂ , A. LucicÂ , & M. PavlovicÂ . 1999. Toxic effects of mycotoxins in humans . Bulletin of the World Health Organization.	No
Websites	https://www.youtube.com/watch?v= 6oLUAnSoOE	

<https://www.youtube.com/watch?v=6kT7vLbuX9U>

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Plant Physiology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-315		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Osama Qasim Abdulameer	e-mail	osama.qasim@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>45. Learn about the plant cell and its different parts and the function of each part. 46. Identify the most important processes that take place within the plant structure at the cellular and tissue levels. 47. Addressing the most important biochemical pathways that take place within the plant. 48. An accurate description of the most important plant hormones and their role in bio structure.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>59. Identify the plant cell with all its parts and distinguish it from the animal cell. 60. Knowing the most important functions that take place at the cellular and tissue levels. 61. Tracking the vital pathways that take place inside the cell and knowing the inputs and outputs of these pathways. 62. Identify some of the important compounds in the plant and their vital roles 63. Identify the most important scientific methods for preparing different types of solutions accurately. 64. Laboratory detection of the most important biological processes that take place inside the plant cell. 65. Using laboratory methods to extract important compounds in the plant cell. 66. Identify the types of nutrients needed by plants, their vital role, and symptoms of their deficiency on plant tissue. 67. Identify the most important scientific methods used to grow plants in the laboratory and study their nutrition.</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p><u>Part A – Plant cell structure and its component :</u> An introductory overview of the plant cell, its precise components, and the role of each component in regulating the work of cells in an integrated manner within the plant tissues. [4 hrs.] Addressing the water relations between the plant cell within the tissue and the external environment, and identifying how the water content of the cell is regulated.. [4 hrs] Identify the different mechanisms through which water is lost from the plant cell in order to remain in balance with its external environment, as well as identify the surrounding environmental conditions that drive the plant cell to resort to any of these mechanisms. [4 hrs.] Addressing the most important mechanisms used by the plant to transfer water and nutrients between the cells of the different tissues of the plant, the importance of each of these methods, how they occur, and what are the most important environmental conditions that control their work. [4 hrs.]</p> <p><u>Part B – Metabolism</u> An introductory summary on metabolism and touching on the most important</p>

	<p>metabolic processes that take place inside the plant cell [2 hrs]</p> <p>The process of photosynthesis and identifying its most important steps, stages, inputs and outputs of these reactions, as well as the most important environmental conditions that control them. [6 hrs.]</p> <p>The breathing process, its stages, the most important interactions that it includes, the inputs and outputs of these interactions, and the most important factors that control it [2hrs]</p> <p>An introduction to the most important mechanisms through which metabolites are transported between different plant tissues and cells, and an introduction to how these mechanisms occur and the conditions that control them. [2 hrs.]</p> <p>An introduction to hormones and plant growth regulators, the most important differences between them, the chemical composition of these substances, and the most important biological activities that control them [2 hrs.]</p> <p>Types of plant hormones and their mechanism of action at the level of the plant cell and knowledge of the most important vital processes that activate or inhibit them [2 hrs.]</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical classes designed to introduce you to plant physiology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are plant cells, their basic characteristics, structure and metabolisms processes . An interactive tutorial and by considering types of simple experiments In methods of preparing different solutions, expressing their concentrations, and methods of estimating some important compounds in the plant cell, and observing some important phenomena in the laboratory at the level of the plant cell.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	79	Structured SWL (h/w)	7
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 course
Week 2	Plant cell structure
Week 3	Plant cell structure
Week 4	Water Relations
Week 5	Mathematical problems for calculating water potential
Week 6	Loss of water from the plant
Week 7	Mid-term Exam
Week 8	Mechanisms of Solute Transport Across Plasma Membranes

Week 9	Metabolism
Week 10	Photosynthesis (Light reactions)
Week 11	Photosynthesis (Dark reactions)
Week 12	Respiration
Week 13	Photo assimilate Translocation
Week 14	Plant hormones
Week 15	Plant hormones
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Solutions and their types.
Week 2	Lab 2: Preparation of different types of solutions and methods of expressing their concentrations 1
Week 3	Lab 3: Preparation of different types of solutions and methods of expressing their concentrations 2
Week 4	Lab 4: Cellular membranes and water relations
Week 5	Lab 5: Osmosis and Imbibition
Week 6	Lab 6: Plasmolysis
Week 7	Lab 7: Transpiration
Week 8	Lab 8: Photosynthesis
Week 9	Lab 9: Mineral nutrition- Macro elements
Week 10	Lab 10: Mineral nutrition- Microelements
Week 11	Lab 11: Methods of plant nutrition studying

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

Required Texts	- أساسيات فسيولوجيا النبات . 2001. د. بسام طه ياسين كلية العلوم جامعة قطر	Yes
Recommended Texts	Plant Physiology, 3rd ed by Lincoln Taiz and Eduardo Zeiger, 2002 2. Plant Physiology, Development and Metabolism, Satish C Bhatla , Manju A. Lal, 2018. ISBN 978-981-13-2022-4 ISBN 978-981-13-2023-1 (eBook) 3. PLANT PHYSIOLOGY Vince Ördög , 2011 . 4. Plant Solute Transport Edited by ANTHONY YEO Haywards Heath, West Sussex, UK, TIM FLOWERS School of Life Sciences University of Sussex, UK, 2007.	No
Websites	pdf.pdf المحاليل الكيميائية - مكتبة الفريد الإلكترونية	

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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Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Pollution		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-322		
ECTS Credits	5		
SWL (hr/sem)	79		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farid Mushib Mahdi	e-mail	Farid.m.mahdi@meuc.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>49. This class discusses the fundamental aspects of Environmental Pollution.</p> <p>50. It's important to all related students where it gives a brief and articulate explanation of this science.</p> <p>51. Highlights the general information about the pollutant types, definitions, risk factors, biological effects, treatment techniques, and how to sustain the eco-systems.</p> <p>52. Underlie the principles and application of the treatment techniques to mitigate the hazardous impact of such pollutants.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>68. Discuss reasons behind studying environmental pollution and explain how pollutants can affect the life of all organisms.</p> <p>69. Outline the necessary methods for mitigating the pollutants.</p> <p>70. Describe the modes of how pollutants can transfer through the food chain or any other path till delivered to human.</p> <p>71. Explain the role of air, water, and soil contaminants and how they affect the ecosystems.</p> <p>72. Explain the basis of the treatment techniques in environmentally sound honors.</p> <p>73. Describe the dangerous effect of microbial pollution plus chemical pollution and their hazardous impact on mankind life.</p> <p>74. Discuss the main events of the global pollution problems such as acid rains and heat trapping.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Part A – pollutant identification, classification, and health impacts:</u></p> <p>Introduction to environmental pollution, how scientists define it through history, and how we can classify the pollutants according to their properties, effect, structure, and targets. [8 hrs.]</p> <p>Overview of pollutants amplification, introduction to pollutant transmission, and the types of pollutants and their health risks. [4 hrs.]</p> <p><u>Part B – pollution groups</u></p> <p>Introduction for the identification, types, and classification of pollutants. How it transfers through the environment till living organisms, give examples of the most dangerous contaminants, and describe the effects of such pollutants on health. [2 hrs.]</p> <p>Introduction for the primary pollutants via their definition, classification types, chemical structure, transmission and give examples of such pollutants. [4 hrs.]</p> <p>Introduction for the secondary pollutants via their definition, classification types, chemical structure, transmission and give examples of such pollutants. [4 hrs.]</p>

	<p>Introduction for the air pollutants via their definition, classification types, chemical structure, transmission and give examples of such pollutants. [4 hrs.]</p> <p>Introduction for the water pollutants via their definition, classification types, chemical structure, transmission and give examples of such pollutants. [4 hrs.]</p> <p>Introduction for the soil pollutants via their definition, classification types, chemical structure, transmission and give examples of such pollutants. [4 hrs.]</p> <p>Introduction for the pollutant's treatment techniques via their definition, classification types, chemical structure, transmission and give examples of such pollutants, and how can we mitigate the concentrations of these pollutants. [4 hrs.]</p> <p>Introduction for the health risks and effects of different kinds of pollutants via their definition, classification types, chemical structure, transmission and give examples of such pollutants. [2 hrs.]</p> <p>Introduction for the global problems of pollution such as acid rains, heat trapping, thermal pollution and Nino phenomena via their definition, transmission and give examples of such pollutants. Additionally, explain how to reduce such problems. [4 hrs.]</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical classes designed to introduce them to the issue of pollution. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are pollutants, their basic characteristics, structure, classification, treatment, mitigation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic treatment techniques including bioreactors, bioventing, bio-pilling and thermal treatment. These activities are interesting to the students.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition and concept of environmental pollution and pollutant classification systems
Week 2	Air pollution and atmospheric layers
Week 3	Sources and types of air pollutants and particulate matter
Week 4	Air polluting gases, global warming, and acid rain
Week 5	Secondary air pollutants, their dangers and ways to reduce them
Week 6	Radioactive contamination, noise pollution, food and drug contamination
Week 7	Soil pollution
Week 8	Water pollution, physical and chemical properties of water
Week 9	Definition of water pollution, its sources and types
Week 10	Sources and types of water pollutants, El Nino phenomenon
Week 11	Surface freshwater pollution and methods of treatment
Week 12	River water pollution, groundwater pollution
Week 13	oil pollution
Week 14	Treatment and reduction of various water pollutants
Week 15	Water determinants and standards
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: lab. safety procedures and Solutions & Samples handling.
Week 2	Lab 2: Measuring Dissolved Oxygen (DO) in water.
Week 3	Lab 3: Biochemical Oxygen Demand (BOD)
Week 4	Lab 4: Free CO ₂ in Water
Week 5	Lab 5: Measuring Salinity by Titration
Week 6	Lab 6: Measuring samples Acidity & Alkalinity
Week 7	Lab 7: Measuring Residual Free Chlorine
Week 8	Lab 8: Measuring of Hardness
Week 9	Lab 9: Measuring of Sulphate
Week 10	Lab 10: Measuring of chemical oxygen demand COD
Week 11	Lab 11: Air Pollution
Week 12	Lab 12: Measuring of electrical conductivity
Week 13	Lab 13: Measuring of TSS and TSS
Week 14	Lab 14: Measuring of total organic carbon TOC
Week 15	Lab 15: Measuring of Chlorin in water
Week 16	Get the lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Environmental pollution, Laurant hogs. Ministry of higher education and scientific research.	Yes
Recommended Texts	1. Al Saadi, H. A. (2006). Principles of Ecology and Environment. Al-Yazori publisher, Amman-Jordan. 2. WHO. (World Health Organization). (1996). Guideline for drinking water quality. Health & Criteria and other supporting information. 2nd edition. Geneva.	No
Websites	https://www.sciencedirect.com	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Principle of Research Methodology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-317		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Jaber Esmael kalefa	e-mail	Jaber.Esmael@meuc.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/10/2025	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 Objectives

أهداف المادة الدراسية

This study aims

The objectives of the basics of scientific research encompass a range of foundational goals aimed at equipping individuals with the skills, knowledge, and mindset necessary for effective inquiry. Here's an organized breakdown:

- 1. Understand Scientific Inquiry:** Grasp the systematic process of asking questions, investigating phenomena, and refining knowledge through structured methods.
- 2. Develop Critical Thinking:** Cultivate the ability to analyze information, evaluate evidence, and reason logically to draw objective conclusions.
- 3. Formulate Hypotheses/Questions:** Learn to craft testable hypotheses and research questions that guide investigations.
- 4. Master Methodologies:** Gain proficiency in qualitative, quantitative, experimental, and observational research designs.
- 5. Acquire Data Skills:** Learn techniques for collecting, organizing, and analyzing data using appropriate statistical or thematic tools.
- 6. Uphold Ethics:** Adhere to integrity, transparency, and responsibility in research, including informed consent and data privacy.
- 7. Communicate Findings:** Effectively share results through academic writing, presentations, and visualizations for peer and public engagement.
- 8. Enhance Problem-Solving:** Apply structured approaches to address complex issues and propose evidence-based solutions.
- 9. Expand Knowledge:** Contribute new insights to existing literature, driving intellectual and practical advancements.
- 10. Support Evidence-Based Decisions:** Provide reliable data to inform policies, practices, and innovations across fields.
- 11. Foster Innovation:** Stimulate technological and conceptual breakthroughs by exploring uncharted territories.
- 12. Encourage Collaboration:** Promote teamwork and peer review to validate research quality and foster interdisciplinary progress.
- 13. Nurture Curiosity:** Inspire a passion for discovery and openness to exploring novel ideas and challenges.

	<p>14. Critique Literature: Evaluate existing studies to identify gaps, biases, and opportunities for further research.</p> <p>15. Bridge Theory and Practice: Apply theoretical frameworks to real-world problems, ensuring research relevance and impact.</p> <p>16. Promote Lifelong Learning: Embrace continuous skill development and adaptability in an evolving scientific landscape.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Module Learning Outcomes of <i>Basics of Scientific Research</i> By the end of this module, learners will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate understanding of the scientific method Explain the systematic steps of scientific inquiry (observation, hypothesis, experimentation, analysis, conclusion). 2. Formulate research questions and hypotheses Design clear, testable, and focused research questions or hypotheses aligned with a defined problem or gap in knowledge. 3. Select appropriate research methodologies Compare qualitative, quantitative, experimental, and observational methods and choose the best fit for a research objective. 4. Design a research proposal Outline a structured research plan, including objectives, methodology, tools, timelines, and ethical considerations. 5. Apply data collection and analysis techniques Use tools (e.g., surveys, experiments, interviews) to gather data and apply basic statistical or thematic analysis to interpret results. 6. Critically evaluate research literature Analyze existing studies to identify strengths, weaknesses, gaps, and biases, and contextualize findings within broader scholarship. 7. Adhere to ethical standards in research Recognize ethical dilemmas (e.g., plagiarism, confidentiality, consent) and apply ethical guidelines to research design and execution. 8. Communicate research findings effectively Present results through academic writing, visual aids (charts, graphs), and oral presentations tailored to diverse audiences. 9. Apply critical thinking to problem-solving

	<p>Evaluate evidence, identify logical fallacies, and propose evidence-based solutions to real-world or theoretical problems.</p> <p>10. Collaborate in peer-review processes</p> <p>Provide constructive feedback on others’ work and incorporate peer insights to refine research quality and validity.</p> <p>11. Use technology for research efficiency</p> <p>Leverage digital tools (e.g., reference managers, data analysis software) to enhance research productivity and accuracy.</p> <p>12. Connect theory to practice</p> <p>Translate theoretical concepts into practical research applications that address societal, environmental, or technical challenges.</p> <p>13. Develop a growth mindset for lifelong learning</p> <p>Reflect on research experiences to identify areas for improvement and commit to continuous skill development in scientific inquiry.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part A – Theoretical lectures</p> <ol style="list-style-type: none"> 1. Introduction to Scientific Research 2. The Scientific Method and Inquiry Process 3. Formulating Research Questions and Hypotheses 4. Research Design and Methodology 5. Literature Review and Critical Analysis 6. Data Collection Techniques 7. Data Analysis and Interpretation 8. Ethical Principles in Research 9. Scientific Writing and Communication 10. Technology and Tools for Research 11. Critical Thinking and Problem-Solving in Research 12. Peer Review and Collaborative Research 13. Applying Research to Real-World Problems 14. Capstone Project: Designing and Presenting a Research Proposal

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Implementation Framework
	<ul style="list-style-type: none"> • Phase 1: Foundational knowledge (lectures, tool training). • Phase 2: Application (workshops, micro-projects). • Phase 3: Synthesis (capstone projects, peer reviews). <p>This approach ensures students gain both competency in scientific research methods and the critical, ethical, and collaborative mindset needed for impactful inquiry.</p>

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

	Projects / Lab.	1	10% (10)	Continuous	All
	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 Scientific Research: Defining research, its purpose, and its role in advancing knowledge.
Week 2	The Scientific Method and Inquiry Process: Steps of systematic investigation: observation, hypothesis, experimentation, analysis, and conclusion.
Week 3	Formulating Research Questions and Hypotheses: Techniques for crafting focused, testable questions and hypotheses
Week 4	Research Design and Methodology: Overview of qualitative, quantitative, experimental, and observational approaches.
Week 5	. Literature Review and Critical Analysis: Strategies for sourcing, evaluating, and synthesizing existing scholarly work.
Week 6	Data Collection Techniques: Tools for gathering data: surveys, experiments, interviews, and observations.
Week 7	Data Analysis and Interpretation: Basic statistical methods and thematic analysis for qualitative and quantitative data.
Week 8	Mid exam
Week 9	Ethical Principles in Research: Addressing plagiarism, informed consent, confidentiality, and research integrity.

Week 10	Scientific Writing and Communication: Structuring reports, abstracts, and papers; visualizing data (graphs, charts).
Week 11	Technology and Tools for Research: Using reference managers, data analysis software, and digital collaboration platforms.
Week 12	Critical Thinking and Problem-Solving in Research: Evaluating evidence, identifying biases, and addressing research challenges.
Week 13	Peer Review and Collaborative Research: Engaging in constructive feedback and teamwork for quality assurance.
Week 14	Applying Research to Real-World Problems: Translating findings into practical solutions for societal or technical issues.
Week 15	Capstone Project: Designing: Integrating knowledge to develop, execute.
Week 16	Final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> • Kothari, C. R., and Gaurav Garg. Research Methodology: Methods and Techniques. New Delhi: New Age International Publishers, 2019. Print • Kumar, Ranjit. Research Methodology: A Step by Step Guide for Beginners. Noida: Pearson India Education Services Pvt Ltd, 2007. Print. 	No
Recommended Texts	Stages in Scientific Research Process Presented by Ganesh Dive.	No
Websites	https://www.slideshare.net/tonyscaria/enzymology-biochemistry-revision-notes	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

المواد الدراسية

للمستوى الرابع

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Bacterial toxins		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-422		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Aeshah Muhnah Mohammed	e-mail	Aeshah M.M.@meuc.edu.iq
Module Leader's Acad. Title	Assistant Prof	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>53. This class discusses the fundamental aspects of bacterial toxins .</p> <p>54. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>55. Highlights the most important toxins produced by bacteria, their types, mechanism of action and effects.</p> <p>56. Recognizing the importance of toxins produced by different bacterial species and their important role in the virulence of bacterial cells.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>75. A- Knowledge and understanding: The undergraduate student will be introduced to the most important toxins secreted by bacteria as virulence factors that increase the bacteria's susceptibility to pathogens.</p> <p>76. B- Subject-specific skills: the student at the undergraduate level acquires the ability to distinguish between virulence factors and learn about toxins produced by bacteria of different types.</p> <p>77. Methods of teaching and learning: It is a direct explanation with students with drawings, as well as a power point presentation, in addition to educational video clips regarding the subject.</p> <p>78. Assessment methods: daily exams (cozzes), monthly exams, reports on the subject in addition to final exams.</p> <p>79. C- Thinking skills: the student in the bachelor's degree acquires the ability to distinguish between virulence factors and learn about toxins produced by bacteria of different types.</p> <p>80. D - general and transferable skills (other skills related to employability and personal development).</p> <p>81. Gaining scientific knowledge, the ability to diagnose and know the causes of diseases..</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Bacteria toxins which can be classified as either exotoxins or endotoxins. Exotoxins are generated and actively secreted; endotoxins remain part of the bacteria. Usually, an endotoxin is part of the bacterial outer membrane, and it is not released until the bacterium is killed by the immune system. The body's response to an endotoxin can involve severe inflammation. In general, the inflammation process is usually considered beneficial to the infected host, but if the reaction is severe enough, it can lead to sepsis. Exotoxins are typically proteins with enzymatic activity that interfere with host cells triggering the symptoms associated with the disease. Exotoxins are also relatively specific to the bacteria that produce it; for example, diphtheria toxin is only produced by <i>Corynebacterium diphtheriae</i> bacteria and is required for the diphtheria disease. Some bacterial toxins can be used in the treatment of tumors. Endotoxins most commonly refer to the lipopolysaccharide (LPS) or lipooligosaccharide (LOS) that are in the outer plasma membrane of Gram-negative bacteria. Not all strains of a bacteria species are virulent; there are some strains of <i>Corynebacterium diphtheriae</i> that do not produce diphtheria toxin and are considered nonvirulent and nontoxigenic. Additional classifications used to describe toxins include enterotoxin, neurotoxin, leukocidin or hemolysin which indicate where in the host's body the toxin targets. . Enterotoxins target the intestines, neurotoxins</p>

target neurons, leukocidin target leukocytes (white blood cells), and hemolysins target red blood cells. Exotoxin activity can be separated into specific cytotoxic activity or broad cytotoxic activity based on whether the toxin targets specific cell types or various cell types and tissues, respectively. Lethal toxins refers to the group of toxins that are the obvious agents responsible for death associated with the infection.

Toxinosis is pathogenesis caused by the bacterial toxin alone, not necessarily involving [bacterial infection](#) (e.g. when the bacteria have died, but have already produced toxin, which are ingested). It can be caused by [Staphylococcus aureus](#) toxins, for example.

Clostridial

There are over 200 [Clostridium](#) species in the world that live in mundane places such as soil, water, dust, and even our digestive tracts. Some of these species produce harmful toxins such as botulinum toxin and tetanus toxin among others. Most clostridium species that do have toxins typically have binary toxins with the first unit involved in getting the toxin into the cell and the second unit cause cellular stress or deformation. Clostridial toxins are widespread and aid in the production of many diseases in humans and other organisms. Clostridial toxins are known to aid in gastrointestinal diseases and there is a wide range of mechanisms that clostridial toxins take to invade or enter the cell of the host. Pore forming bacterial toxins are common and have a very interesting way of entering or invading the host's cell. The mechanism that clostridial toxins follow includes clostridia forming pores and then the pores inserting themselves into the cell membrane of cells. Clostridial toxins have the ability to damage or alter the cell membrane damaging the extracellular matrix of the organism.

[Toxin A](#) and [toxin B](#) are two toxins produced by *Clostridium difficile*. Toxin A and toxin B are [glycosyltransferases](#) that cause the antibiotic-associated pseudomembranous colitis and severe diarrhea that characterize disease presentation of [C. diff infections](#).

Botulinum

[Botulinum neurotoxins](#) (BoNTs) are the causative agents of the deadly food poisoning disease botulism, and could pose a major biological warfare threat due to their extreme toxicity and ease of production. They also serve as powerful tools to treat an ever expanding list of medical conditions that benefit from its paralytic properties, an example drug with BoNTs as the active ingredient is Botox.¹ They also serve as powerful tools to treat an ever expanding list of medical conditions that benefit from its paralytic properties delivered through localized injections, an example drug with BoNTs as the active ingredient is Botox. Botulinum neurotoxins (BoNTs) are protein neurotoxins that are produced by the bacteria Clostridium. BoNTs are now largely being studied due to their ability to aid in chronic inflammatory diseases such as acne, multiple sclerosis, and for cosmetic purposes

Tetanus

[Clostridium tetani](#) produces tetanus toxin (TeNT protein), which leads to a fatal condition known as [tetanus](#) in many vertebrates (including humans) and

invertebrates. While tetanus toxin is produced from *Clostridium tetani*, a spore forming bacteria found in soil, Tetanus is a paralytic disease that is global and commonly affects newborns as well as non-immunized individuals. Tetanus enters the body of organisms through wounds or skin breaks and can be found in manure, soil, and dust. Tetanus mechanism includes tetanus preventing the transmission of glycine and γ -aminobutyric acid from inhibitory interneurons in the spinal cord, leading to spastic paralysis. Glycine is an important amino acid that is essential for adequate nervous system function aiding in cell communication throughout the body. When tetanus toxin enters the body it is taken up by cholinergic nerve endings traveling axonally into the brain and spinal cord, disrupting motor function in individuals. Although tetanus is a damaging toxin that has a multitude of symptoms it can be prevented through vaccination.

Perfringolysin O toxin

Clostridium perfringens is an anaerobic, gram-positive bacteria that is often found in the large and small intestines of humans and other animals. *Clostridium perfringens* has the ability to reproduce quickly producing toxins relating to the cause of diseases. The pore-forming toxin perfringolysin has the ability to cause gangrene in calves with the presence of alpha toxin.

Staphylococcal

Immune evasion proteins from *Staphylococcus aureus* have a significant conservation of protein structures and a range of activities that are all directed at the two key elements of host immunity, complement and neutrophils. These secreted virulence factors assist the bacterium in surviving immune response mechanisms.

Examples of toxins produced by strains of *S. aureus* include enterotoxins that cause food-poisoning, exfoliative toxins that cause [scalded skin syndrome](#), and [toxic-shock syndrome toxin](#) (TSST) that underlies [toxic shock syndrome](#).^[7] These toxin examples are classified as [superantigens](#).^[7]

Multi-drug resistant *S. aureus* strains also produce alpha toxin, classified as a [pore-forming toxin](#), which can cause [abscesses](#).

Shiga

[Shiga toxins](#) (Stxs), responsible for foodborne illnesses, are a classification of toxins produced by [Shiga toxin-producing Escherichia coli](#) (STEC) and [Shigella dysenteriae](#) serotype 1. Stx was first identified in *S. dysenteriae* and was later found to be produced by certain strains of *E. coli*.^[8] Stxs act through inhibiting protein synthesis of infected cells and can be divided into two antigenically different groups: Stx/Stx1 and Stx2.^[7] Stx1 is immunologically equivalent to Stx; however, it received a separate name to distinguish that it's produced by STEC not *S. dysenteriae*. Stx2 is produced only by STEC and is antigenically different from Stx/Stx1. The term shiga-like toxins was previously used to further distinguish the shiga toxins produced by *E. coli*, but nowadays, they are collectively referred to as shiga toxins.^[8] Within the STEC strains, a subgroup classified as enterohemorrhagic *E. coli* (EHEC) represent a class of pathogens with more severe virulence factors in addition to the ability to produce Stxs. EHEC infections result in more severe diseases of hemorrhagic colitis and [hemolytic uremic](#)

[syndrome](#).^[7] There are around 200 strains of STEC, and the wide range of diversity and virulence between them can be partly attributed to phage-mediated horizontal transfer of genetic material.

Anthrax toxin

[Anthrax](#) disease in humans results from infection with toxin producing [Bacillus anthracis](#) strains that can be inhaled, ingested in contaminated food or drink, or obtained through breaks in the skin like cuts or scrapes.^[10] Domestic and wild animals can also be infected via inhalation or ingestion. Depending on the route of entry, disease can present initially as inhalation anthrax, cutaneous anthrax, or gastrointestinal anthrax, but eventually will spread throughout the body, resulting in death, if not treated with antibiotics.^[10] [Anthrax toxin](#) is composed of three domains: protective antigen (PA), edema factor (EF), and lethal factor (LF). EF is an adenylate cyclase that targets ATP. LF enzyme is a metalloprotease that confers the lethal phenotype associated with anthrax disease.^[7] As LF is the agent responsible for the death of infected hosts, it is classified in the group of lethal toxins.

Diphtheria toxin

[Diphtheria toxin](#) is produced by virulent [Corynebacterium diphtheriae](#) that infect the mucosal membranes of the throat and nasal cavity causing a gray, thickened lining of the throat, sore throat, weakness, mild fever, swollen glands of the neck, and difficulty breathing.^[11] Diphtheria toxin is an ADP-ribosyltransferase that inhibits protein synthesis which causes the symptoms associated with the disease.^[7] [Diphtheria](#) used to be a leading cause of childhood death until the creation of a vaccine.^[11] The [diphtheria vaccine](#) contains a diphtheria toxoid, antigenically identical yet inactivated and non-toxic. When the toxoid is introduced to the body in a vaccine, an immune response is mounted without sequelae associated with the toxigenicity.

Pertussis toxin

[Pertussis toxin](#) is produced by virulent [Bordetella pertussis](#) and is responsible for the disease of whooping cough, a respiratory disease that can be fatal for infants. The severe, uncontrollable coughing makes it difficult to breathe causing the “whooping” sound that occurs with inhalation. *Bordetella pertussis* targets cilia of the upper respiratory tract which are damaged by the Pertussis toxin, an ADP-ribosyltransferase that targets G-proteins.

Cholera toxin

[Cholera](#), characterized by copious watery diarrhea, is a potentially life-threatening illness transmitted through the fecal-oral route via food or water contaminated with toxigenic [Vibrio cholerae](#).^[13] *V. cholerae* targets the intestines and secretes [cholera toxin](#), an exotoxin and potent enterotoxin that acts as an ADP-ribosyltransferase targeting G-proteins. This causes an increase in intracellular cAMP and forces intestinal cells to expel significant amounts of water and electrolytes into the lumen

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this unit is to encourage students to participate in exercises as well as a series of lectures and practical classes designed to introduce you to bacterial toxins. At the same time refine and broaden critical thinking skills through topics covered in the lectures including what bacterial toxins are, their prevalence and quantification. An interactive educational program through looking at the types of simple experiments (practical classes) provides training in basic techniques including isolation of pathogenic bacteria, their dissemination and extraction of their different toxins. These activities are fun for the students.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 of bacterial toxins
Week 2	Classification of bacterial toxins
Week 3	ADP-ribosylation toxins
Week 4	Cholera toxins
Week 5	Other <i>V. cholerae</i> O1/O139 toxins
Week 6	<i>E. coli</i> heat-labile enterotoxin
Week 7	Exam
Week 8	<i>E. coli</i> heat-stable enterotoxin
Week 9	<i>Bordetella pertussis</i>
Week 10	Tetanus toxin
Week 11	Toxins that act on 28S rRNA
Week 12	Exam
Week 13	Pore-forming toxins1
Week 14	Pore-forming toxins2
Week 15	Endotoxins

Week 16	Preparatory week before the final Exam
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Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Disinfection and sterilization in laboratories
Week 2	Lab 2: General introduction to bacterial toxins
Week 3	Lab 3: Endotoxins and Exotoxins
Week 4	Lab 4: Bacterial food poisonings
Week 5	Lab 5: Virulence factors produced by bacteria as toxins1
Week 6	Lab 6: Virulence factors produced by bacteria as toxins2
Week 7	Lab 7: Enteric toxins
Week8	Lab 8: Estimation of toxic doses

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	علم السموم البكتريا , الاستاذ الدكتور رحاب العزاوي 2010 - السموم الميكروبية رشا حمد الميهي وجمهورية مصر العربية 2014	Yes
Recommended Texts	Microbial toxins : current research and future trends. Proft, Thomas. Norfolk: Caister Academic Press. 2014 Lectures by Prof. Dr. Mai Talib Falih - -	No

	University of Baghdad / college of Science .2016	
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Biotechnology and Genetic Engineering		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	Bio-414			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	4	Semester of Delivery		7
Administering Department	Bio	College	Meddle east	
Module Leader	Farqad Abdraheem AbdIftaah		e-mail	Farqad .A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	none		e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	57. This class discusses the fundamental aspects of Biotechnology and Genetic Engineering. 58. its importance to mankind in a brief and articulate explanation of this newly originated science. 59. Underlie the principles and application of Recombinant phage DNA technology in pharmaceutical, and biomedical fields.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	82. Familiarity with the basics of biotechnology and genetic engineering. 83. Understanding the fermentation process and how to develop it. 84. Benefiting from theoretical information in the production and development of products. 85. An attempt to design a production line, starting from isolating the microorganism to obtaining the product. 86. Using different technologies to develop and improve production
Indicative Contents المحتويات الإرشادية	1.1. Introduction and Definition 1.2 Historical Perspectives 1.3 Scope and Importance of Biotechnology 1.4 Commercial Potential 1.5 An Interdisciplinary Challenge 1.6 A Quantitative Approach 1.7 Classical vs Modern Concepts 1.8 Quality Control in Manufacturing 1.9 Product Safety 1.10 Good Manufacturing Practices (GMP) 1.11 Good Laboratory Practices (GLP) Fine Structure of a Gene 12.2 From Gene to Protein 12.3 Gene Expression 12.4 Transcription 12.5 Genetic Code 12.6 Translation 12.7 Regulation of Gene Expression 12.8 Genetic Basis of Differentiation and Development 12.9 Housekeeping Genes 12.10 Genetics of Cancer 12.11 Immunogenetics Tools of Recombinant DNA Technology

	<p>15.3 Making Recombinant DNA</p> <p>15.4 DNA Library</p> <p>15.5 Transgenics—Introduction of Recombinant DNA into Host Cells</p> <p>15.6 Identification of Recombinants</p> <p>15.7 Polymerase Chain Reaction (PCR)</p> <p>15.8 DNA Probes</p> <p>15.9 Hybridization Techniques</p> <p>15.10 DNA Sequencing</p> <p>15.11 Site-directed Mutagenesis</p> <p>Cell- and Tissue-Culture Techniques</p> <p>19.3 Applications of Cell and Tissue Cultures</p> <p>Animal Cell Culture Techniques</p> <p>Biological Fuel Generation</p> <p>21.2 Single-cell Protein</p> <p>21.3 Sewage Treatment</p> <p>21.4 Environmental Biotechnology</p> <p>21.5 Medical Biotechnology</p> <p>21.6 Agriculture and Forest Biotechnology</p> <p>21.7 Food and Beverage Biotechnology</p> <p>21.8 Safety in Biotechnology</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical classes designed to introduce you to Biotechnology and Genetic Engineering. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what Biotechnology and Genetic Engineering, its basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic Biotechnology and Genetic Engineering techniques including the isolation, extraction of plasmid DNA, and running agarose gel electrophoresis. These activities are interesting to the students.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	21	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	6	12% (5)	5 and 10	LO #1, #2 and #10, #11
	Assignments	6	12% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	8% (20)	Continuous	All
	Report	4	8% (5)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to course
Week 2	The concept of biotechnology - a brief history and techniques of plant tissue cultures
Week 3	Animal tissue culture techniques
Week 4	Enzymatic techniques: production and extraction
Week 5	Biosensors, Types and Applications of biosensors
Week 6	Biotechnology applications in the food and industrial fields
Week 7	Mid-term Exam
Week 8	Introduction to genetic engineering
Week 9	Endonucleases, Application of restriction enzymes
Week 10	Molecular cloning & Cloning vectors
Week 11	Gene expression in cloned cells
Week 12	Types of gene expression profiling
Week 13	DNA sequencing and hybridization
Week 14	Techniques used in the field of genetic engineering
Week 15	Preparatory week before the final Exam
Week 16	final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of genetic engineering
Week 2	Lab 2: Devices and equipment required in genetic engineering laboratories
Week 3	Lab3: Cultures and Tissue Culture for Nucleic Acids Extraction.

Week 4	Lab 4: DNA Extraction
Week 5	Lab 5: Enzymes Used in Cloning
Week 6	Lab 6: PCR (Polymerase Chain Reaction) technique
Week 7	Lab 7: get your lab reports up to date, Revision for Module test (Mid-term Exam)
Week 8	Lab 8: Primer design
Week 9	Lab 9: Gel electrophoresis
Week 10	Lab 10: DNA transfer to filters
Week 11	Lab 11: Probes labelling preparation
Week 12	Lab 12: DNA hybridization
Week 13	Lab 13: Synthesis of Complementary DNA (cDNA) from mRNA molecules
Week 14	Lab 14: DNA Sequencing
Week 15	Lab 15: Establishment of genes Libraries
Week 16	Lab 16 : get your lab reports up to date, Revision for Module test (Final exam)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biotechnology and genetic engineering / Kathy Wilson Peacock, 2010 ISBN 978-0-8160-7784-7	No
Recommended Texts	A.J. Nair. Introduction to Biotechnology and Genetic Engineering. ISBN: 978-1-934015-16-2 , 2008	No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Genetic Microbiology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-421		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farqad AbdIraheem AbdIftaah	e-mail	Farqad .A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	none	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>60. This class discusses the fundamental aspects of Genetic Microbiology. 61. its importance to mankind in a brief and articulate explanation of this newly originated science. 62. Highlights the general morphology, genetic structure, function of Genetic Microbiology 63. Underlie the principles and application of Recombinant phage DNA technology in pharmaceutical, and biomedical fields.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>87. Discuss reasons for studying Genetic Microbiology 88. Outline methods for cultivation of Genetic Microbiology; purification of gene; detection of gene and their components; investigation of Molecular Biology gene function; assess the value of Genetic Microbiology genome sequencing. 89. Explain the role of primers in gene nucleic acid synthesis; the roles of host proteins in Genetic Microbiology genome replication</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Microbial Genetics Genetics is the study of heredity which is concerned with how information in nucleic acids is expressed nucleic acids are duplicated and transmitted to progeny these processes account for the characteristics of progeny</p> <p>2. DNA Replication in Bacteria During replication, enzymes known as polymerases transport nucleotides from the cytoplasm that are complimentary to the template and fit them into place, resulting in two strands, one parental and one new one. The replication is said to be semi-conservative because the parental strand is conserved (remains the same).</p> <p>Steps of DNA Replication Copied in 5' to 3' direction Polymerase can only add nucleotides to 3' end In Prokaryotes, replication begins at specific site in chromosome called the origin of replication Replication of DNA begins a specific site on the DNA template termed the origin and proceeds in both directions from the origin until nuclear division and cytokinesis take place. Replication speed = 1000 nucleotides/sec</p> <p>RNA Synthesis in Bacteria Transcription is the synthesis of RNA and involves the assembly of nucleotides by an enzyme, RNA polymerase.</p> <ol style="list-style-type: none"> 1. RNA polymerase binds to DNA at a promoter site near the gene to be transcribed. 2. RNA polymerase travels the length of the DNA using it as a template to duplicate. 3. The RNA polymerase continues until it reaches a termination site at which time the transcription is complete.

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 as well as a series of lectures and practical classes designed to introduce you to Microbial Genetics. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are Microbial Genetics, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic Microbial Genetics.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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
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Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 course
Week 2	Bacterial Conjugation- Definition, Principle, Process, Examples
Week 3	Other conjugative elements
Week 4	Bacterial Transformation
Week 5	Types of Bacterial Transformation
Week 6	What is a plasmid
Week 7	Mid-term Exa
Week 8	How do scientists use plasmids
Week 9	BACTERIAL MUTATION
Week 10	Types of Mutations
Week 11	Mechanisms of mutation
Week 12	Results of mutation
Week 13	DNA damage and repair summary
Week 14	Bacterial Transduction- Definition, Principle, Steps, Examples
Week 15	Gene Transfer

Week 16	Preparatory week before the final Exam
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Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of Genetic Microbiologydiagnoses
Week 2	Lab 2: Introduction to Transformation
Week 3	Lab 3: Isolation of DNA Bacterial
Week 4	Lab 4: Isolation of RNA Bacterial
Week 5	Lab 5: Genetic Modification: Bacteria Producing Human Insulin
Week 6	Lab 6: Isolating gene and vector
Week 7	Lab 7: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamental Molecular Biology . Lizabeth A. Allison 2007	No
Recommended Texts	Molecular Genetics of Bacteria Jeremy W. Dale Simon F. Park University of Surrey, UK	No
Websites	www.blackwellpublishing.com www.wiley.com	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mycology I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-424		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Alhan Hashim Sheat	e-mail	Alhan.H.S.@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>64. This class discusses the fundamental aspects of mycology.</p> <p>65. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>66. Highlights the general morphology, genetic structure, function of fungi as a vital starting point for knowledge of fungus diseases and gene transfer technology.</p> <p>67. Underlie the principles and application of fungal technology in pharmaceutical, and biomedical fields.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>90. Discuss reasons for studying fungi; explain how fungi differ from other organisms; define the term 'fungi'.</p> <p>91. Outline methods for cultivation of fungi; purification of fungi; detection of fungi and their components</p> <p>92. Describe the mechanisms of fungal growth .</p> <p>93. Explain the basis of the shapes, sizes and colors of the reproductive units, especially the spores, vary and conidia with a variety of fungal species .</p> <p>94. Describe the fungi that cause disease for human ,animal, inscta and plant..</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Part A – fungal structure, classification, and nomenclature replication:</u></p> <p>Introduction to fungal structure. History of fungal. Fungi (singular Fungus) are known as thallic organisms(Eukaryotic) Fungi are of great importance due to their close association with all aspects of life, which made it of great importance to study these</p> <p>The group of organisms, identifying them and studying their characteristics, highlighting the importance of studying fungi for the role they play in fungi</p> <p>human life positively or negatively. Complex organic compounds as energy and carbon sources. Fungi share some other features with fungi. Their cell walls are made of chitin, which is found in the exoskeletons of arthropods.Fungi produce a number of pigments, including melanin, which is also found in the hair and skin of animals. Like In animals, fungi also store carbohydrates as glycogen. [8 hrs]</p> <p>Most fungi grow on agar dextros potato medium (PDA) This medium is nutritionally rich and encourages the growth of mycelium at the expense of sporulation.It is replaced with weak media such as (CMA) medium (agar meal corn) because it contains more accessible carbohydrates. Cellulose-decomposing and food-destroying fungi retain their ability to produce cellulose enzyme cellulase When using weak media and to encourage the formation of blackboards, pieces of paper or dung are added to it .Animals or pieces of filter papers or seeds, depending on the type of mushroom.It is difficult to isolate fungi from infected tissues or soil infested soils or from decaying materials due to the rapid spread of fungi, bacteria and actinomycetes</p>

which includes antagonism . [4 hrs]

Part B – fungal groups

fungi reproduce sexually. However, Imperfecti Fungi or Deuteromycetes lack sexual reproduction. There are usually two phases in the life cycle of fungi.

The two metaphases are the haploid, which has an odd number of chromosomes chromosomes (n_1) and diploid, which has a diploid number of Chromosomes in the nucleus (n_2) and gametes are usually haploid (n_1) produced after the process of diploid nuclear fusion from the chromosomal set (n_2) as in Sexual spores such as oospores, zygosporangia, and so on. and produces Monophase ($1n$) again in the life cycle of the fungus through the process of meiosis (meiosis) The number of chromosomes in the nucleus will be bisected . [2 hrs]

Symbiosis interactions or symbioses between fungi and other organisms fall within a range wide range of categories. In some cases, coexistence is obligatory (symbiosis obligate). Necessary for life (but it affects its host negatively, which leads to death.

The pathogens and parasites get the ingredients for their life from the host It affects her family negatively, which leads to her death. The difference between parasites and pathogens is that the pathogens. They cause disease, while parasites do so only in rare cases. Commensal relationships benefit one partner, but do not harm the other. And there are fungi ,It enters into mutualistic relationships that benefit from it and benefit the other (the breadwinner). Therefore, besides the intrusive and restorative fungi, there are species that live with other plants living Symbiotic, they either live with some algae to form lichens, or with plant roots. The fungus (Micorrhiza) is in symbiotic relationships . [4 hrs]

The term metabolitesim secondary covers a wide range of processes Metabolites that have no relationship except that they are all activated when the growth of the fungus stops in one way or another In other words, when fungi grow on suitable environments, they carry out food metabolism and produce compounds Metabolism is described as secondary, when growth stops, using glucose in a small amount cases. The primary metabolites are those intermediate compounds produced as a result of food metabolism during the growth process. The secondary metabolites of fungi are bioactive compounds, most of which are toxic to humans ,Animal, plant, and microorganisms are therefore called Mycotoxins when they are present Toxic to humans and animals, while those that are toxic to plants are called Phytotoxins and a group of compounds Toxic to microorganisms, it is called Antibiotic. So far, nearly 1000 compounds have been known Metabolic compounds, which are the result of more than 1000 secondary metabolic reactions that differ in their structure in a way Large in chemical composition, and each reaction is specific to each species or type of fungus . [4 hrs]

Types of Spores and their shapes: The shapes, sizes and colors of the reproductive units,

especially the spores, vary, The conidia differ in the diversity of fungal taxa, and such diversity is noted in Deuteromycetes imperfect fungi in particular which may be Their spores are single-celled, or yeast-like, and multiply By donating. The majority of fungi reproduce by mycelia, which may be A type of mycelium, a cystic fungus containing a septum with a simple hole or

Basidiomycosis of the type of mycelia, in which the hole is of the type dolipore and mycelium with canine connections. despite the existence of Multiple ways for fungi to multiply, but the formation of blackboards is one of the most important Chlamydo spores are formed by the transformation of one of the cells The vegetative layer of the fungal hyphae or a group of these cells is round and thickened The wall, and this type of blackboard does not spread, but is liberated when the thread is dissolved Fungal form chlamydial spores, which may form peripheral As for the conidia, they are formed on specialized cells that are not part of the site or its middle Vegetative mycelium. [2 hrs]

Fungal growth mechanisms is approximately 50-100 microns in length of the hypha. The elongation is in the mycelium By the top of the Haifa, that is, the growth is apical. The more mature parts of the fungal hyphae are unable to Rather, it plays an important role in supporting growth by forming new protoplasm and transporting it by flow cytoplasm to the developing apex. So Gow & Goody stated in 1990 that life in fungi is At their tops, this means that the intercalary growth that occurs in plants does not occur in fungi

In fungi, growth occurs in a space that does not exceed half a micron in length and is called a zone dilation. zone extension, which is full of vesicles and devoid of existing organelles in other regions of the fungus. Vesicles are of two types: Micro vesicles

Their size is less than 100 microns, and other large macro vesicles are more than 100 microns. The follicles are clustered in Spitzenkorper clusters, which are observed for the first time Once by researcher Brunswik in 1924 and the large vesicle Macro vesicles are

Vesicles secretory contains enzymes to build and break down the wall in the process of growth. [4 hrs]

Types of mycotoxins: Mycotoxins are classified on the basis of their sources of synthesis into five main groups:A group of amino acids. such as Pcsilocybin and Ergotamine and the rest of the alkaloids, Fusaric acid and Penicillin. It is a heterogeneous group.It is a mycotoxin, due to its origin from different organic acids , A group of phenolic and aromatic toxins, which are synthesized in a manner.Polyketides They are part of a large group of mycotoxins that create one such methodThe second will be mentioned later in Paragraph (3), and among these types of toxins are Aflatoxins Zearalenones and Griseofulvin. And Shikmic acid method for the synthesis of aromatic amino acids.It is the second way to synthesize a group of aromatic and phenolic toxins.This route contains xanthocillin and cumarins. [2 hrs]

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 as well as a series of lectures and practical classes designed to introduce you to mycology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are fungi, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic fungal techniques including the isolation, diagnosis and classification of a pathogenic fungi. These activities are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 course
Week 2	Introduction taxonomy of fungi
Week 3	Myxomycetes
Week 4	Mastigomycotina
Week 5	Diplomastigomycotina
Week 6	Amastigomycotina
Week 7	Mid-term Exam
Week 8	Zygomycotina
Week 9	Ascomycotina
Week 10	Hemiascomycotina

Week 11	Basidiomycotina
Week 12	Oomycotina
Week 13	Types of disease caused by fungi
Week 14	Dermatophytes
Week 15	Cutaneous mycoses
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of fungal diagnoses
Week 2	Lab 2: Methods of sterilization and culture media for growing fungi
Week 3	Lab 3: Slide preparation
Week 4	Lab 4: Isolation and cultivation of fungi
Week 5	Lab 5: Chemical factors , Factors affecting fungal growth
Week 6	Lab 6: Preservation of fungi
Week 7	Lab 7: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

Required Texts	Alexopoulos . G . J . 1962 . Introductory mycology . John Wiley & sons Inc. N . Y. Bonnie H. Ownley Robert N. Trigiano . 2017. Plant Pathology Concepts and Laboratory Exercises .3ed . edt . CRC Press Taylor & Francis Group . Boca Raton London New York.	No
Recommended Texts	Volk . J . Thomas .1994 . The fungi . Academic press. - M. Peraica, B. RadicÂ , A. LucicÂ , & M. PavlovicÂ . 1999. Toxic effects of mycotoxins in humans . Bulletin of the World Health Organization.	No
Websites	https://www.youtube.com/watch?v=_6oLUAnSo0E https://www.youtube.com/watch?v=6kT7vLbuX9U	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mycology I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-414		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Alhan Hashim Sheat	e-mail	Alhan.H.S.@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>68. This class discusses the fundamental aspects of mycology.</p> <p>69. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>70. Highlights the general morphology, genetic structure, function of fungi as a vital starting point for knowledge of fungus diseases and gene transfer technology.</p> <p>71. Underlie the principles and application of fungal technology in pharmaceutical, and biomedical fields.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>95. Discuss reasons for studying fungi; explain how fungi differ from other organisms; define the term 'fungi'.</p> <p>96. Outline methods for cultivation of fungi; purification of fungi; detection of fungi and their components</p> <p>97. Describe the mechanisms of fungal growth .</p> <p>98. Explain the basis of the shapes, sizes and colors of the reproductive units, especially the spores, vary and conidia with a variety of fungal species .</p> <p>99. Describe the fungi that cause disease for human ,animal, inscta and plant..</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Part A – fungal structure, classification, and nomenclature replication:</u></p> <p>Introduction to fungal structure. History of fungal. Fungi (singular Fungus) are known as thallic organisms(Eukaryotic) Fungi are of great importance due to their close association with all aspects of life, which made it of great importance to study these</p> <p>The group of organisms, identifying them and studying their characteristics, highlighting the importance of studying fungi for the role they play in fungi</p> <p>human life positively or negatively. Complex organic compounds as energy and carbon sources. Fungi share some other features with fungi. Their cell walls are made of chitin, which is found in the exoskeletons of arthropods.Fungi produce a number of pigments, including melanin, which is also found in the hair and skin of animals. Like In animals, fungi also store carbohydrates as glycogen. [8 hrs]</p> <p>Most fungi grow on agar dextros potato medium (PDA) This medium is nutritionally rich and encourages the growth of mycelium at the expense of sporulation.It is replaced with weak media such as (CMA) medium (agar meal corn) because it contains more accessible carbohydrates. Cellulose-decomposing and food-destroying fungi retain their ability to produce cellulose enzyme cellulase When using weak media and to encourage the formation of blackboards, pieces of paper or dung are added to it .Animals or pieces of filter papers or seeds, depending on the type of mushroom.It is difficult to isolate fungi from infected tissues or soil infested soils or from decaying materials due to the rapid spread of fungi, bacteria and actinomycetes</p>

which includes antagonism . [4 hrs]

Part B – fungal groups

fungi reproduce sexually. However, Imperfecti Fungi or Deuteromycetes lack sexual reproduction. There are usually two phases in the life cycle of fungi.

The two metaphases are the haploid, which has an odd number of chromosomes chromosomes (n_1) and diploid, which has a diploid number of Chromosomes in the nucleus (n_2) and gametes are usually haploid (n_1) produced after the process of diploid nuclear fusion from the chromosomal set (n_2) as in Sexual spores such as oospores, zygosporangia, and so on. and produces Monophase ($1n$) again in the life cycle of the fungus through the process of meiosis (meiosis) The number of chromosomes in the nucleus will be bisected . [2 hrs]

Symbiosis interactions or symbioses between fungi and other organisms fall within a range wide range of categories. In some cases, coexistence is obligatory (symbiosis obligate). Necessary for life (but it affects its host negatively, which leads to death.

The pathogens and parasites get the ingredients for their life from the host It affects her family negatively, which leads to her death. The difference between parasites and pathogens is that the pathogens. They cause disease, while parasites do so only in rare cases. Commensal relationships benefit one partner, but do not harm the other. And there are fungi ,It enters into mutualistic relationships that benefit from it and benefit the other (the breadwinner). Therefore, besides the intrusive and restorative fungi, there are species that live with other plants living Symbiotic, they either live with some algae to form lichens, or with plant roots. The fungus (Micorrhiza) is in symbiotic relationships . [4 hrs]

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Fungal growth mechanisms is approximately 50-100 microns in length of the hypha. The elongation is in the mycelium By the top of the Haifa, that is, the growth is apical. The more mature parts of the fungal hyphae are unable to Rather, it plays an important role in supporting growth by forming new protoplasm and transporting it by flow cytoplasm to the developing apex. So Gow & Goody stated in 1990 that life in fungi is At their tops, this means that the intercalary growth that occurs in plants does not occur in fungi

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Vesicles secretory contains enzymes to build and break down the wall in the process of growth. [4 hrs]

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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 as well as a series of lectures and practical classes designed to introduce you to mycology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are fungi, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic fungal techniques including the isolation, diagnosis and classification of a pathogenic fungi. These activities are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 course
Week 2	Introduction of fungi
Week 3	Natural habitat of fungi
Week 4	Reproduction in fungi
Week 5	Fungal growth mechanisms
Week 6	Shapes and types of spores
Week 7	Mid-term Exam
Week 8	Sexual Reproduction in fungi
Week 9	Secondary Metabolism
Week 10	Toxines of fungi

Week 11	Relationships between fungi and other microorganism
Week 12	Medical mycology
Week 13	Types of disease caused by fungi
Week 14	Dermatophytes
Week 15	Cutaneous mycoses
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of fungal diagnoses
Week 2	Lab 2: Methods of sterilization and culture media for growing fungi
Week 3	Lab 3: Slide preparation
Week 4	Lab 4: Isolation and cultivation of fungi
Week 5	Lab 5: Chemical factors , Factors affecting fungal growth
Week 6	Lab 6: Preservation of fungi
Week 7	Lab 7: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Alexopoulos . G . J . 1962 . Introductory mycology . John Wiley & sons Inc. N . Y. Bonnie H. Ownley Robert N.Trigiano .	No

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Websites	https://www.youtube.com/watch?v= 6oLUAnSoOE https://www.youtube.com/watch?v=6kT7vLbuX9U	

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
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	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Virology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-422		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farqad AbdIraheem AbdIftaah	e-mail	Farqad .A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>72. This class discusses the fundamental aspects of virology.</p> <p>73. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>74. Highlights the general morphology, genetic structure, function of viruses as a vital starting point for knowledge of virus diseases and gene transfer technology.</p> <p>75. Underlie the principles and application of Recombinant phage DNA technology in pharmaceutical, and biomedical fields.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>100. Discuss reasons for studying viruses; explain how viruses differ from other organisms; define the term 'virus'.</p> <p>101. Outline methods for cultivation of viruses; purification of viruses; detection of viruses and their components; investigation of virus gene function; assess the value of virus genome sequencing.</p> <p>102. Describe the modes of transmission of plant viruses and animal viruses; evaluate the roles of vectors in virus transmission; discuss the immune mechanisms encountered by an animal virus when it enters the body of a new host.</p> <p>103. Explain the role of primers in virus nucleic acid synthesis; the roles of virus and host proteins in virus genome replication; outline the replication mechanisms of virus DNAs and RNAs; the term 'reverse transcription'.</p> <p>104. Explain the basis of the Baltimore classification of viruses.</p> <p>105. Describe the HSV-1 virion; outline the main features of the HSV-1 genome; the replication cycle of HSV-1; describe the replication cycle of parvoviruses; the difference between autonomous and defective parvoviruses.</p> <p>106. Discuss the main events of the rotavirus replication cycle; how rotaviruses cause disease etc..</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Part A – Viral structure, classification, and nomenclature replication:</u></p> <p>Introduction to virus structure, Virus genomes, proteins, capsids, virion membranes, occlusion bodies. History of virus classification and nomenclature, Modern virus classification and nomenclature and Baltimore classification. Transmission of plant viruses, vertebrate viruses, invertebrate viruses. [8 hrs]</p> <p>Overview of virus replication. Introduction to transcription, translation and transport. Transcription of virus genomes in eukaryotes, Translation in eukaryotes. Transport in eukaryotic cells, transcription and translation of viruses in bacteria. Overview of virus genome replication. Locations of virus genome replication in eukaryotic cells: Initiation of genome replication, Polymerases, DNA replication, Double-stranded RNA replication, Single-stranded RNA replication and reverse transcription. Introduction to assembly and</p>

exit of virions from cells, nucleocapsid assembly, formation of virion membranes and virion exit from the infected cell. [4 hrs]

Part B – Viral groups

Introduction to herpesviruses: human herpesviruses (virion), HSV-1 genome organization, replication, latent herpesvirus infection and other dsDNA viruses. Introduction to parvoviruses; examples of parvoviruses (virion); replication and other ssDNA viruses. [2 hrs]

Introduction to reoviruses; Rotavirus virion; Rotavirus replication; Other dsRNA viruses. Introduction to picornaviruses; some important picornaviruses; Picornavirus Virion; replication; recombination; experimental systems and Other plus-strand RNA viruses. Introduction to rhabdoviruses; some important rhabdoviruses (virion and genome organization); replication, other minus-strand RNA viruses, viruses with ambisense genomes and reverse genetics. [4 hrs]

Introduction to retroviruses (virion); replication; examples of retroviruses; as gene vectors; endogenous retroviruses. Introduction to HIV (virion); genome; HIV-1 replication; variability; Progression of HIV infection; Prevention of HIV transmission. Importance of HBV (virion); Non-infectious particles, Soluble virus protein; HBV genome; HBV genetic groups; HBV replication; Prevention and treatment of HBV infection and other reverse-transcribing DNA viruses. [4 hrs]

Introduction to bacterial viruses (bacteriophages): Single-stranded RNA phages; Double-stranded RNA phages; Single-stranded DNA phages; and Double-stranded DNA phages. Introduction to viruses and cancer; Papillomavirus-linked cancers; Polyomavirus-linked cancers; Epstein-Barr virus-linked cancers; Kaposi's sarcoma; Adult T cell leukemia; Hepatocellular carcinoma; Virus-associated cancers in animals; Cell lines derived from virus-associated cancers; How do viruses cause cancer?; Prevention of virus-induced cancers Introduction to prions; transmissible spongiform encephalopathies; The nature of prions; Prion diseases; Prion strains; Prion transmission; the protein-only hypothesis [2 hrs]

Introduction to virus vaccines; Live attenuated virus vaccines; Inactivated virus vaccines; Virion subunit vaccines; Live recombinant virus vaccines and Mass production of viruses for vaccines. Virus-like particles; Synthetic peptide vaccines; DNA vaccines; Storage and transport of vaccines. [4 hrs]

Introduction to anti-viral drugs; development of anti-viral drugs; examples of anti-viral drugs; drug resistance; anti-viral drug research. Introduction to emerging viruses; Viruses in new host species; Viruses in new areas; Viruses in new host species and in new areas; New viruses; Recently discovered viruses; Re-emerging viruses; Virus surveillance; Dealing with outbreaks. [2 hrs]

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 as well as a series of lectures and practical classes designed to introduce you to virology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are viruses, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic virological techniques including the isolation, propagation and plaque-purification of bacteriophage and bioassay of a pathogenic insect virus. These activities are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 course
Week 2	Virus structure
Week 3	Classification and nomenclature of viruses
Week 4	Virus transmission
Week 5	Attachment and entry of viruses into cells, Transcription, translation, and transport
Week 6	Virus genome replication, Assembly and exit of virions from cells
Week 7	Mid-term Exam

Week 8	Herpesviruses (and other dsDNA viruses), Parvoviruses (and other ssDNA viruses)
Week 9	Reoviruses (and other dsRNA viruses), Picornaviruses (and other plus-strand RNA viruses)
Week 10	Retroviruses, Rhabdoviruses (and other minus-strand RNA viruses)
Week 11	Human immunodeficiency viruses, Hepadnaviruses (and other reverse-transcribing DNA viruses)
Week 12	Bacterial viruses, Prions
Week 13	Viruses and cancer, Virus vaccines
Week 14	Anti-viral drugs
Week 15	Emerging viruses
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of viral diagnoses
Week 2	Lab 2: Laboratory diagnosis methods for viral infections: specimen collection
Week 3	Lab 3: Isolation and cultivation of viruses
Week 4	Lab 4: Isolation and cultivation of Bacteriophage culture
Week 5	Lab 5: One-step multiplication curve (Run and Read Results)
Week 6	Lab 6: Detection of viral nucleic acid, Serological tests
Week 7	Lab 7: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	VIROLOGY PRINCIPLES AND APPLICATIONS by John B. Carter and Venetia A. Saunders, 2007.	No
Recommended Texts	Viruses: Biology, Application and Control by David Harper. ISBN: 9780815341505 Garland Science. An alternative is Basic Virology, 3rd Edition by Wagner, Hewlett, Bloom & Camerini. Wiley Blackwell ISBN-10: 1405147156 ISBN-13: 978-1405147156.	No
Websites	https://www.youtube.com/watch?v=Eq9Jlq9HvMg , https://www.youtube.com/watch?v=WGKoJRNKADY , www.wiley.com/go/carter	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Industrial microbiology		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	Bio-423			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	4	Semester of Delivery		8
Administering Department	Bio	College	Meddle east	
Module Leader	Aeshah Muhnah Mohammed		e-mail	Aeshah M.M.@meuc.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/10/2025		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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>Study of Microorganisms: Learn about the structure, classification, and biological interactions of bacteria, fungi, yeasts, and other microorganisms used in industry.</p> <p>Understanding Biological Processes: Study the biological interactions and processes that occur within microorganisms and apply this knowledge to industrial processes.</p> <p>Developing Fermentation Technologies: Study and improve fermentation processes that use microorganisms to produce biological products, such as pharmaceuticals, enzymes, and food.</p> <p>Gene Engineering and Biotechnology: Study advanced technologies such as gene mutation and genetic engineering to improve microorganisms and enhance their production of industrial products.</p> <p>Improving the Efficiency of Industrial Processes: Develop and improve industrial processes used in the production of biological products, such as optimizing fermentation conditions...</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Understanding Industrial Fermentation Processes: Students gain an understanding of the concept of fermentation and its associated microscopic processes. They acquire knowledge about the procedures required to produce biological products using microorganisms.</p> <p>Identifying Microorganisms Used in Industry: Students learn about bacteria, fungi, yeasts, and other microorganisms used in industrial processes. They understand the classification and distinctive characteristics of each type and how they are used in industrial production.</p> <p>Using Modern Biotechnology: Students learn about modern biotechnology and its application in industrial microbiology. They can understand genetic engineering and the improvement of microorganisms to increase productivity and enhance desirable traits.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Introduction to Industrial Microbiology: This course introduces the concept of industrial microbiology and its importance in industry and practical applications.</p> <p>Classification and Identification of Microorganisms: This course covers the classification and identification of bacteria, fungi, yeasts, viruses, and other microorganisms used in industry.</p> <p>Industrial Fermentation Techniques: This course explores the fundamental concepts of fermentation processes and their applications in industrial production, including bacterial and fungal fermentation and the use of yeasts.</p> <p>Gene Engineering and Genetic Engineering: This course examines advanced</p>

	<p>techniques in gene engineering and genetic manipulation for improving microorganisms and their industrial applications.</p> <p>Analysis and Optimization of Industrial Processes: Students learn how to analyze and optimize industrial processes used in the production of biological products, such as pH control.</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy to be adopted in delivering this material is to encourage student participation in exercises, while simultaneously developing and expanding their critical thinking skills. This will be achieved through interactive lessons and tutorials, and by incorporating simple experiments that involve engaging, hands-on activities.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Industrial Microbiology
Week 2	Microbial Species Used in Industry
Week 3	Bio-Mechanisms and Microbial Product Control
Week 4	Requirements for Microbial Industries
Week 5	Microbial Isolation
Week 6	Cultivation Media
Week 7	Fermenters
Week 8	Acetic Acid Production
Week 9	Amino Acid Production
Week 10	Vitamin production

Week 11	Mushroom production
Week 12	Single-cell protein production
Week 13	Organic solvent production
Week 14	Antibiotic production
Week 15	Probiotics
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: General instructions within the Industrial microorganisms laboratory
Week 2	Lab 2: Isolation of industrial microorganisms and methods of preserving isolates
Week 3	Lab 3: methods of preserving isolates
Week 4	Lab 4: Isolation of antibiotic-producing from bacteria
Week 5	Lab 5: Microbial production of antibiotics
Week 6	Lab 6: Isolation of amylase-producing microorganisms
Week 7	Lab 7: Isolation of protease-producing microorganisms
Week 8	Lab 8: Production of citric acid from microorganisms
Week 9	Lab9: Some applications of lactic fermentation
Week 10	Lab10: The use of microorganisms in the production of matured cheese and yoghurt

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Industrial Microbiology: Principles and Applications" Michael J. Waites: Wiley)	Yes
Recommended Texts	Copyright © 2000-2023 by John Wiley & Sons, Inc. or related companies. All rights reserved.	No
Websites	https://4lfonsina.files.wordpress.com/2012/11/industrial-microbiology-an-introduction-0632053070-wiley.pdf	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Food Microbiology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-413		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Raneem Mohammed Abdjljeel	e-mail	Raneem.mohammed@meuc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<p>a) Identifying the microorganisms that cause food spoilage</p> <p>b) How to handle these microorganisms</p> <p>c) Teaching the student how to distinguish between different genera and species of contaminating microorganisms</p> <p>d) Identifying the microorganisms present in food</p> <p>e) Teaching the student how to handle these microorganisms to improve a particular</p>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>This course aims to familiarize students with the scientific terminology of industrial and food microbiology and how to write their scientific names. It also aims to teach students how to manage food spoilage caused by microorganisms and how to use microorganisms in the food industry.</p>
Indicative Contents المحتويات الإرشادية	<p>This course covers a variety of topics and concepts related to microorganisms in a food context. Some of the introductory content may include:</p> <p>Definition of Food Microorganisms:</p> <p>The concept of food microorganisms and their importance in nutrition science.</p> <p>Identification of important microorganisms in food, such as bacteria and fungi.</p> <p>The Effect of Microorganisms on Food:</p> <p>Examining the role of microorganisms in food preparation and spoilage.</p> <p>Understanding the effect of microorganisms on flavor, spoilage, and chemical transformations in food.</p> <p>Microorganisms and the Digestive System:</p> <p>Examining beneficial microorganisms in the digestive system, such as beneficial gut bacteria.</p> <p>Understanding the effect of microorganisms on the digestion and absorption of nutrients.</p> <p>Microorganisms and Food Preservation:</p> <p>Examining the use of microorganisms in various technologies.</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy to be adopted in delivering this material is to encourage student participation in exercises, while simultaneously developing and expanding their critical thinking skills. This will be achieved through interactive lessons and tutorials, and by incorporating simple experiments that involve engaging, hands-on activities.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	History and development of food microbiology.
Week 2	Characteristics of predominant microorganisms in food.
Week 3	Sources of microorganisms in food
Week 4	Normal microbiological quality of foods and its significance
Week 5	Microbial growth characteristics
Week 6	Factors influencing microbial growth in food
Week 7	Microbiological standard of food
Week 8	Microbial food spoilage
Week 9	Important factors in microbial food spoilage
Week 10	Spoilage of Specific Food Groups
Week 11	Food Spoilage by Microbial Enzymes
Week 12	Microbial foodborn diseases
Week 13	Parasites
Week 14	Indicators of Bacterial Pathogens
Week 15	Control of microorganisms in food
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: General instructions within the food microbiology laboratory
Week 2	Lab 2: Methods for Microbiological Examination of Foods
Week 3	Lab 3: Study of the microbiology of milk
Week 4	Lab 4: Study of the microbiology of cheese
Week 5	Lab 5: study of the microbiology of red meat and chicken
Week 6	Lab 6: Study of the microbiology of fish

Week 7	Lab 7: Study of the microbiology of fruits and vegetables
Week 8	Lab 8: Study of microbiology in eggs
Week 9	Lab 9: Study of microorganisms in pickles and sugary foods
Week 10	Lab 10: Study of microorganisms in canned food
Week 11	Lab 11: Study of the microbiology of bread and cereals

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Food Microbiology: Fundamentals and Frontiers" بواسطة Michael P. Doyle وRobert L. Buchanan.	Yes
Recommended Texts	Copyright © 2000-2023 by John Wiley & Sons, Inc. or related companies. All rights reserved.	No
Websites	https://www.wiley.com/en-us/Food+Microbiology%3A+Fundamentals+and+Frontiers%2C+5th+Edition-p-9781555816261	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Chordates		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-426		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Raneem Mohammed AbdlJaleel	e-mail	Raneem Mohammed@meuc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<ul style="list-style-type: none">• Identifying and classifying different animal groups• Anatomical comparison of different body organs and systems• Comparing animals to each other to observe differences in the complexity of their bodies
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>A. Knowledge and Understanding:</p> <ol style="list-style-type: none">1. The student will be able to identify organisms belonging to the phylum Chordata.2. The student will be able to classify these organisms.3. The student will be able to compare them structurally and behaviorally.4. The student will be able to dissect laboratory animals.5. The student will be able to create skeletons of some animals and preserve others. <p>B. Subject-Specific Skills:</p> <ol style="list-style-type: none">1. The student will understand the basis for classifying these organisms.2. The student will be able to explain these differences and relate them to environmental variables.3. The student will be able to connect ancestors and current generations evolutionarily.4. The student will be able to envision the future of these organisms.5. The student will understand and explain the role of materials used in preservation.
Indicative Contents المحتويات الإرشادية	<p>Teaching and Learning Methods:</p> <ol style="list-style-type: none">A. Theoretical LecturesB. Practical LaboratoriesC. Films and SlidesD. Field Trips for Application <p>Assessment Methods:</p> <ol style="list-style-type: none">1. Daily and Monthly Exams2. Practical Tests3. Oral Exams4. Attendance <p>C. Thinking Skills -</p> <ol style="list-style-type: none">1. Ability to identify these organisms2. Raising laboratory animals3. Dissecting animals

	<p>4. Creating skeletons and taxidermied models</p> <p>5. Working in museums or animal breeding facilities</p> <p>D. General and Transferable Skills (Other skills related to employability and personal development) -</p> <p>1. Visual aids and models</p> <p>2. PowerPoint projector</p> <p>3. Analytical equipment</p> <p>4. Field visits to laboratories</p> <p>16. A. Learner Outcomes and Teaching and Learning Methods</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this unit is to encourage students to participate in exercises as well as a series of lectures and practical classes designed to introduce you to it. At the same time refine and broaden critical thinking skills through topics covered in the lectures including what bacterial toxins are, their prevalence and quantification. An interactive educational program through looking at the types of simple experiments (practical classes) provides training in basic techniques including isolation of pathogenic bacteria, their dissemination and extraction of their different it. These activities are fun for the students.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	63	Structured SWL (h/w)	7
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	5
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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	Characteristics of the Phylum Chordata
Week 2	Classification of the Chordata
Week 3	Class Fish
Week 4	Class Amphibians and Reptiles
Week 5	Class Aves
Week 6	Class Mammals

Week 7	Midterm Exam
Week 8	Comparative Study of the Skeletal System
Week 9	Comparative Study of the Muscular System
Week 10	Comparative Study of the Respiratory System
Week 11	Comparative Study of the Urinary System
Week 12	Comparative Study of the Integumentary System
Week 13	Comparative Study of the Digestive System
Week 14	Study of Chordata Behaviors
Week 15	Final Exam Review
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Characteristics of the Phylum Chordata
Week 2	Classification of the Chordata
Week 3	Class Fish
Week 4	Class Amphibians and Reptiles
Week 5	Class Aves
Week 6	Class Mammals
Week 7	Comparative Study of types of Chordata
Week 8	Comparative Study of types of Chordata

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	حبيب شكري.د للحبليات المقارن التشريح أساسيات	Yes
Recommended Texts	None	No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Enzymology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-413		
ECTS Credits	5		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Sci
Module Leader	Farqad Abdulraheem Abulfataah	e-mail	Farqad.A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>This study aims</p> <p>Students do study the following fields:</p> <ol style="list-style-type: none"> 1. Classification of enzymes 2. Characteristic of enzymes 3. Structure of enzymes
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Comprehension enzyme properties. 2. Conception the enzymatic chemical reaction. 3. Perception the application of enzymes. 4. The Students learn how to prepare chemical solutions 5. The students Learn how to prepare bacterial extract 6. The students Learn how to detect different types of enzymes <p>Indicative Contents</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part A – Theoretical lectures</p> <p>Introduction to enzymology .General review of protein.Nomenclature of enzyme .Activation energy.Mechanism of enzyme action .Specificity of enzyme.Assay of enzyme and Units of enzyme activity.1.Assay of enzyme and Units of enzyme activity.2.[10 hrs]</p> <p>Enzyme inhibition part 1 and 2.Enzyme inhibition part 1 and 2.Enzyme kinetics part 1 and 2.Enzyme kinetics part 1 and 2.[10 hrs]</p> <p>Examples of enzyme inhibition.Clinical enzymology.Industrial enzymology. [8 hrs]</p> <p>Revision problem classes [3 hrs]</p> <p>Part B – Practical labs</p> <p>Introductin to Enzymes.: Preparing chemical solutions.Cell disruption methods1.Cell disruption methods2.Preparation of bacterial extract.Protease enzyme.Lipase enzyme. [18 hrs]</p> <p>Aspartate aminotransferase,Alanine aminotransferase.Decarboxylase enzyme .denitrification.Alkaline phosphatase.: Cytochrome oxidase.. catalase.Lecithinase .coagulase.of antibiotic:3.Production</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>Teaching Techniques: The lectures are explained through audio files, videos and recording files of the lectures so that the student can refer to them whenever he wants that to avoid the problems of power outages and weak in internet. The lectures are also explained and communicating with students through the meeting by the Classroom for the purpose of agitation topics related to the scientific subject to be discussed in a scientific way. Students are given daily tests in order to keep the student in touch with the scientific material and to consolidate the information in the student's mind. Assigning students to answer intellectual questions about some topics and discussing them in the next lecture to develop the aims of scientific research and delve into the subtleties of the scientific material and study the various aspects of the subject in terms of its connection to other science and their applications.</p> <p>Assigning students to write some reports related to the scientific subject and their interaction with the scientific material to set grades that fall within the student's scientific assessment . Taking into consideration the student's attendance in lectures and the extent of his ability to participate in the discussions presented during the lectures, and this is part of the student's assessment methods. This will be achieved through lectures, labs, and interactive tutorials and by types of practical diagnostic methods and involving some sampling activities that are interesting to the students.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 enzymology .
Week 2	General review of protein.
Week 3	Nomenclature of enzyme .
Week 4	Activation energy.
Week 5	Mechanism of enzyme action .
Week 6	Specificity of enzyme.
Week 7	Assay of enzyme and Units of enzyme activity.
Week 8	Mid exam
Week 9	Assay of enzyme and Units of enzyme activity.

Week 10	Enzyme inhibition part 1 and 2.
Week 11	Enzyme inhibition part 1 and 2.
Week 12	Enzyme kinetics part 1 and 2.
Week 13	Examples of enzyme inhibition.
Week 14	Clinical enzymology.
Week 15	Industrial enzymology.
Week 16	Fainal exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introductin to Enzymes.
Week 2	Lab 2: Preparing chemical solutions.
Week 3	Lab 3: Cell disruption methods1.
Week 4	Lab 4: Cell disruption methods2.
Week 5	Lab 5: Preparation of bacterial extract.
Week 6	Lab 6: Protease enzyme
Week 7	Lab 7: Lipase enzyme.
Week 8	Lab 8: Aspartate aminotransferase,Alanine aminotransferase.
Week 9	Lab9: Decarboxylase enzyme .
Week 10	Lab 10: denitrification.
Week 11	Lab 11: Alkaline phosphatase.
Week 12	Lab 12: Cytochrome oxidase.
Week 13	Lab 13: . catalase.
Week 14	Lab 14: Lecithinase .
Week 15	Lab 15: coagulase.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Fundamentals of Biochemistry (2005) by Lehninger 2-Enzyme Inhibition and Bioapplications (2012) by Rakesh Sharma 3-Clinical chemistry and enzymology (2008) by Jaromir Kotyza and Radim Cerny.	No
Recommended Texts	Murray, R. K., Bender, D.A., BothamEI, K.M., Kennelly, P.J., Rodwell, V.W., Weil, P.A. (2016). Harper,s Illustrated Biochemistry .29th edition. The Mc GRAW-Hill Companies, USA.	No
Websites	https://www.slideshare.net/tonyscaria/enzymology-biochemistry-revision-notes	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	pathogenic bacteria		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	Bio-415			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	4	Semester of Delivery		7
Administering Department	Bio	College	Meddle east	
Module Leader	Hamza Kadum Alzubaidi		e-mail	Hamza.Kadum@meuc.edu.iq
Module Leader's Acad. Title	Assistant Prof.		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	None		e-mail	None
Scientific Committee Approval Date	01/10/2025		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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>This course aims to clarify and define the key concepts of pathogenic bacteria, providing a comprehensive introduction to important terminology, methods of infection and epidemiology, methods for measuring bacterial virulence, and bacterial genetic evolution. It then delves into the important groups of pathogenic bacteria based on their scientific classification, studying the specific characteristics and pathogenicity of each bacterial genus. The course covers laboratory diagnostic methods for these genus, including microscopic examination, culture on various bacterial media, serological and phage typing, and modern microbiological diagnostic techniques to enhance accurate diagnosis. Emphasis is placed on the epidemiology of each bacterial genus, infection prevention methods, and developing students' ability to accurately diagnose pathogenic bacteria. Students will work in research groups to learn about sterilization methods, media preparation, and microbiological culture. They will then accurately diagnose clinically important genus species through biochemical tests and culture characteristics, developing their ability to accurately identify bacteria isolated from various pathogenic samples.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>A. Knowledge and Understanding:</p> <p>Focus on pathogenically important bacterial groups in bacteriology, accurate diagnosis of pathogenic species, their epidemiology, and methods of prevention.</p> <p>B. Subject-Specific Skills:</p> <p>Focus on how to prepare and stain samples for microscopic examination, in addition to using different culture media to isolate pathogenic bacterial species.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Teaching and Learning Methods:</p> <p>Using scientific references and direct interaction with students through lectures... and developing students' practical skills and laboratory work through hands-on experiments in the lab.</p> <p>Assessment Methods:</p> <p>Exchanging information with students, students presenting summaries of the previous lecture, quizzes, midterm exams, and reports.</p> <p>C- Thinking Skills:</p> <p>Training and preparing students to work in research groups in the lab and developing their presentation and discussion skills, including different methods for diagnosing bacteria.</p>

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 as well as a series of lectures and pathogenic bacteria classes designed to introduce you to it. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are pathogenic bacteria, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic . pathogenic bacteria
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7

	Projects / Lab.	1	10% (10)	Continuous	All
	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	Comprehensive Introduction to Pathogenic Bacteriology
Week 2	Staphylococcus and its genera
Week 3	Streptococcus and its genera
Week 4	Enterobacteriaceae
Week 5	E. coli, Proteus, Klebsiella
Week 6	Enterobacteriaceae
Week 7	Salmonella, Shigella, Yersinia
Week 8	Mid exam
Week 9	Brucella, Haemophilus, Bordetella
Week 10	Neisseria and its genera
Week 11	Aerobic spore-forming bacteria
Week 12	Bacillus, Clostridium
Week 13	Pseudomonas and its genera
Week 14	Spirochaetes
Week 15	Bacteroides
Week 16	Corynebacteria

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Streptococcus and its genera
Week 2	Enterobacteriaceae
Week 3	E. coli, Proteus, Klebsiella
Week 4	Bacillus, Clostridium
Week 5	Pseudomonas and its genera
Week 6	Spirochaetes
Week 7	Bacteroides

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الجبوري . محييد مدالله . علم البكتريا الطبية . جامعة الموصل . الطبعة الأولى.	No
Recommended Texts	Jawetz, Melnick & Adelberg's Medical Microbiology twenty fourth edition Geo.F.Books. et al . – Alex3-Shrris Medical Microbiology An Introduction to Infectious Disease editors .Kenneth J, Ryan M, et al 4 th edition.	No
Websites	www.blackwellpublishing.com www.wiley.com	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Pathological analyses		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-416		
ECTS Credits	5		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Sci
Module Leader	Aeshah mohana mohammed	e-mail	Aeshah.m.m@meuc.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	Understanding the analyses used in diagnosing various medical conditions. An introduction to pathological analyses with detailed explanations of each test and a comparison with normal results.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A1 - Practical knowledge of the fundamentals of pathological analyses A2 - Knowledge of the causes of diseases and methods of treatment and prevention B - Program-specific skills objectives B1 - Ability to perform pathological analyses B2 - Ability to use analytical equipment skillfully
Indicative Contents المحتويات الإرشادية	Teaching: Preparing printed lectures using diverse and rich modern sources with examples. Teaching: Using various visual aids (display screens, videos, images, posters). Teaching: Using various available materials, supplies, laboratory equipment, and modern technologies. Learning: Practical application in preparing culture media for use in diagnosing microorganisms. Learning: Practical application in diagnosing pathogens using available supplies and laboratory equipment. Learning: Directing questions to students to engage them with the scientific material, as well as participating in enriching dialogue and discussion on the expected diagnosis of diseases.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	General and transferable skills are other skills related to employability and personal development.
	The ability to perform basic pathological analyses and the ability to work in government and private medical laboratories, performing analytical tasks for all diseases with skill and the potential to serve the community and participate in building a civilized and advanced country.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	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	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

assessment	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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	Urine components
Week 2	Urinary tract infection
Week 3	Urinary tract infection
Week 4	Parasitic enteritis
Week 5	Bacterial enteritis
Week 6	Viral enteritis
Week 7	Blood component analysis
Week 8	Mid exam
Week 9	Pregnancy Infections
Week 10	Pregnancy Infections
Week 11	Clinical Chemistry Analyses
Week 12	Clinical Chemistry Analyses

Week 13	Serological Analyses
Week 14	Histopathology
Week 15	Preparation of Histological Samples
Week 16	Fainal exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Urine components
Week 2	Urinary tract infection
Week 3	Urinary tract infection
Week 4	Parasitic enteritis
Week 5	Bacterial enteritis
Week 6	Viral enteritis
Week 7	Blood component analysis
Week 8	Mid exam
Week 9	Pregnancy Infections
Week 10	Pregnancy Infections
Week 11	Clinical Chemistry Analyses
Week 12	Clinical Chemistry Analyses
Week 13	Serological Analyses

Week 14	Histopathology
Week 15	Preparation of Histological Samples

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Plenty of Room for Biology at the Bottom ' an introduction to Bionanotechnology" Ehud Gazit, 2007 Internet Sources	No
Recommended Texts	importance of Clinical Lab Testing Highlighted During Medical Lab Professionals Week". American Clinical Laboratory Association. 2014-04-17. Retrieved 2016-10-17 Laudicina R1, Fenn JP, Freeman V, McCoy C, McLane MA, Mundt L, Polancic J, Randolph T, Shanahan K. Research in clinical laboratory science: professionals' involvement. Clin Lab Sci. 2011 Fall;24(4):235-42. Krivit BA, Heuertz RM. MLO Med Lab Obs. 2011 Jun;43(6):36, 38-9. No abstract available.]Montgomery A, Adeyeni T, San K, Heuertz RM, Ezekiel UR. J Cancer. 2016 Jun 23;7(10):1250-7	No
Websites	https://www.slideshare.net/tonyscaria/enzymology-biochemistry-revision-notes	

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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Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biodiversity		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory
Module Code	Bio-		<input checked="" type="checkbox"/> Lecture
ECTS Credits	6		<input type="checkbox"/> Lab
SWL (hr/sem)	150		<input type="checkbox"/> Tutorial
			<input type="checkbox"/> Practical
			<input type="checkbox"/> Seminar
Module Level	UGx11 4	Semester of Delivery	7
Administering Department	Bio	College	Meddle east
Module Leader	Saleh abdukkader Abdallah	e-mail	Saleh A. Abdallah@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>Biodiversity refers to the diversity of life on Earth in terms of living species, genetic diversity within each species, and the diversity of environments in which living organisms live. Biodiversity is considered one of the basic aspects of ecosystems and represents an important source of environmental sustainability and the continuity of life on the planet. Biodiversity objectives include:</p> <p>A- Cognitive objectives</p> <p>A1- Identify the components of the ecosystem and the importance of biodiversity and its divisions.</p> <p>A2- The importance of biodiversity for the stability of ecosystems.</p> <p>A3- Identify the factors affecting biodiversity and the extinction of species.</p> <p>A4- Identify the most common indicators in calculating biodiversity.</p> <p>A5- Identify primary and secondary succession and its types.</p> <p>B- Program skill objectives</p> <p>B1- Acquire skills to study living communities and their diversity within different ecosystems.</p> <p>B2- Participate in protecting living organisms and reducing their exposure to extinction.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ul style="list-style-type: none"> • Understand the topic of biodiversity and its importance in different environments. • Understand the factors affecting biodiversity that can reduce natural resources. • Understand the food chain and food web and their relationship to biodiversity • Understand the vital indicators for measuring biodiversity • Understand the processes of ecological succession in its various types • Understand the areas of vital importance that are considered environmental hot spots • Understand sustainable development and its importance in preserving biodiversity • Use sustainable development in developing products and reducing the environmental impact of industrial products
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<ul style="list-style-type: none"> • Introduction to biodiversity and its importance in different environments. • Factors affecting biodiversity that can reduce natural resources. • Food chain and food web and their relationship to biodiversity • Bioindicators for measuring biodiversity • Ecological succession and its different types • Hot spots and the importance of preserving them

- Sustainable development and its importance in preserving biodiversity
- Using sustainable development in developing products and reducing the environmental impact of industrial products

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The main strategy that will be adopted in delivering this subject is to encourage students' participation in biodiversity conservation, while at the same time developing and expanding their critical thinking skills. This will be achieved through interactive lessons and tutorials that include some hands-on activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Biodiversity
Week 2	Factors effects on Biodiversity
Week 3	Food Chain and Food Web
Week 4	Biodiversity Indicators
Week 5	Applied Aspects of Biodiversity Indicators
Week 6	First Semester Exam
Week 7	Ecological Succession
Week 8	Succession in Primary Environments
Week 9	Ecotones
Week 10	Sustainable Development and Its Relation to Biodiversity
Week 11	Some Biological Relationships Between Species
Week 12	Predation and Its Relation to Biodiversity
Week 13	Second Semester Exam
Week 14	Microbial Biodiversity
Week 15	Biodiversity in Soil

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	BIODIVERSITY CONSERVATION A Very Short Introduction David W. Macdonald	No
Recommended Texts	Microbial Biodiversity, Biotechnology and Ecosystem Sustainability Cristóbal Noé Aguilar, Sabu Abdulhameed, Raul Rodriguez-Herrera and Shiburaj Sugathan	No
Websites	https://education.nationalgeographic.org/resource/biodiversity/	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Endocrinology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-425		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farqad AbdIraheem AbdIftaah	e-mail	Farqad .A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>The module objectives of an endocrinology module may include:</p> <ol style="list-style-type: none">1. Understanding the principles of endocrinology, including hormone synthesis, secretion, and regulation.2. Describing the structure and function of different endocrine glands, including the pituitary, thyroid, parathyroid, adrenal, pancreas, and gonads.3. Understanding the role of hormones in maintaining homeostasis, including the regulation of metabolism, growth, and development.4. Analyzing the pathophysiology of endocrine disorders, including diabetes, thyroid disorders, adrenal disorders, and reproductive disorders.5. Understanding the principles of endocrine diagnostic testing, including laboratory assessments and imaging techniques.6. Describing the use of pharmacological agents in the treatment of endocrine disorders.7. Understanding the principles of endocrine research, including molecular and genetic approaches to studying hormone function and regulation. <p>Overall, an endocrinology module aims to provide students with a comprehensive understanding of the principles and applications of endocrinology, as well as the practical skills required for diagnosis and treatment of endocrine disorders. The module also aims to emphasize the importance of endocrine research in advancing our understanding of human health and disease.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>The module learning outcomes of an endocrinology module may include:</p> <ol style="list-style-type: none">1. Knowledge and understanding: Students should be able to demonstrate a deep understanding of the principles and applications of endocrinology, including hormone synthesis, secretion, and regulation, as well as the structure and function of different endocrine glands.2. Critical thinking: Students should be able to analyze the pathophysiology of endocrine disorders, including diabetes, thyroid disorders, adrenal disorders, and reproductive disorders, and evaluate the role of hormones in maintaining homeostasis.3. Practical skills: Students should be able to apply their knowledge of endocrine diagnostic testing, including laboratory assessments and imaging techniques, to diagnose endocrine disorders and evaluate treatment efficacy.4. Communication: Students should be able to communicate effectively and clearly about endocrinology concepts, both orally and in writing, using appropriate

	<p>terminology and referencing sources of information.</p> <p>5. Research skills: Students should be able to demonstrate an understanding of the principles of endocrine research, including molecular and genetic approaches to studying hormone function and regulation, and demonstrate the ability to critically evaluate and interpret scientific literature in endocrinology.</p> <p>6. Professional skills: Students should be able to demonstrate professional skills such as ethical conduct, teamwork, and time management, and understand the importance of lifelong learning and professional development in the field of endocrinology. In general, the module learning outcomes of an endocrinology module aim to equip students with the knowledge, skills, and attitudes required to understand the principles and applications of endocrinology, and to apply this knowledge in the diagnosis and treatment of endocrine disorders. The module also aims to emphasize the importance of research skills and professional development in the field of endocrinology.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>The indicative contents of an endocrinology module may include:</p> <ol style="list-style-type: none"> 1. Introduction to endocrinology: Basic concepts, principles, and terminology of endocrinology. The organization and function of different endocrine glands, and the roles of hormones and their regulation. 2. Pituitary gland and hypothalamic control: The structure and function of the pituitary gland, and its regulation by the hypothalamus. The role of growth hormone, prolactin, thyroid stimulating hormone, adrenocorticotrophic hormone, follicle stimulating hormone, and luteinizing hormone in the control of other endocrine glands. 3. Thyroid gland: The structure and function of the thyroid gland, and the synthesis and regulation of thyroid hormones. The role of thyroid hormones in metabolism, growth, and development, and the pathophysiology and treatment of thyroid disorders. 4. Parathyroid gland and calcium homeostasis: The structure and function of the parathyroid gland, and the regulation of calcium homeostasis. The role of parathyroid hormone and calcitonin in calcium metabolism, and the pathophysiology and treatment of calcium disorders. 5. Adrenal gland: The structure and function of the adrenal gland, and the synthesis and regulation of adrenal hormones. The role of glucocorticoids, mineralocorticoids, and adrenal androgens in metabolism, stress response, and sex differentiation, and the pathophysiology and treatment of adrenal disorders. 6. Pancreas and glucose homeostasis: The structure and function of the pancreas, and the synthesis and regulation of insulin and glucagon. The role of insulin and glucagon in glucose metabolism, and the pathophysiology and treatment of diabetes mellitus.

7. Reproductive endocrinology: The structure and function of the male and female reproductive systems, and the synthesis and regulation of reproductive hormones. The role of reproductive hormones in sexual differentiation, puberty, and fertility, and the pathophysiology and treatment of reproductive disorders.

8. Endocrine diagnostic testing: Laboratory assessments, imaging techniques, and clinical evaluation for the diagnosis of endocrine disorders.

9. Pharmacology of endocrine disorders: The use of pharmacological agents in the treatment of endocrine disorders, including hormone replacement therapy, antidiabetic drugs, and thyroid hormone therapy.

10. Endocrine research: Molecular and genetic approaches to studying hormone function and regulation, and the application of endocrine research in clinical practice. Overall, an endocrinology module should provide students with a comprehensive understanding of the principles and applications of endocrinology, including the organization and function of different endocrine glands, the roles of hormones and their regulation, and the pathophysiology and treatment of endocrine disorders. The module should also emphasize the importance of endocrine diagnostic testing, pharmacology, and research in advancing our understanding of human health and disease.

Effective learning and teaching strategies for an endocrinology module may include a combination of the following approaches:

1. Lectures: Lectures can be used to introduce students to key concepts and principles of endocrinology, including the structure and function of different endocrine glands, hormone synthesis and regulation, and the role of hormones in maintaining homeostasis.

2. Case based learning: Case studies can be used to illustrate the practical applications of endocrinology in real world scenarios. These cases can be drawn from fields such as diabetes, thyroid disorders, adrenal disorders, and reproductive disorders.

3. Small group discussions: Small group discussions can be used to encourage students to actively engage with the subject matter, share ideas and insights, and learn from each other. Discussions can focus on case studies, current research topics, and the practical applications of endocrinology in healthcare.

4. Laboratory sessions: Laboratory sessions can provide students with hands on experience in

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>Effective learning and teaching strategies for an endocrinology module may include a combination of the following approaches:</p> <ol style="list-style-type: none"> 1. Lectures: Lectures can be used to introduce students to key concepts and principles of endocrinology, including the structure and function of different endocrine glands, hormone synthesis and regulation, and the role of hormones in maintaining homeostasis. 2. Case based learning: Case studies can be used to illustrate the practical applications of endocrinology in real world scenarios. These cases can be drawn from fields such as diabetes, thyroid disorders, adrenal disorders, and reproductive disorders. 3. Small group discussions: Small group discussions can be used to encourage students to actively engage with the subject matter, share ideas and insights, and learn from each other. Discussions can focus on case studies, current research topics, and the practical applications of endocrinology in healthcare. 4. Laboratory sessions: Laboratory sessions can provide students with hands on experience in endocrine diagnostic testing, including laboratory assessments and imaging techniques.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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 endocrine system
Week 2	Types of glands and its hormones
Week 3	Hypothalamic glands
Week 4	Pituitary gland type 1
Week 5	Pituitary gland type 2
Week 6	Thyroid gland
Week 7	Mid term Exam
Week 8	Parathyroid gland
Week 9	Endocrine pancreas part 1
Week 10	Endocrine pancreas part 2
Week 11	Adrenal gland part 1

Week 12	Adrenal gland part 2
Week 13	Male reproductive system part 1
Week 14	Male reproductive system part 2
Week 15	Female reproductive system
Week 16	Fainal exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction endocrine system
Week 2	Methods of plasma and serum keeping
Week 3	hypothalamus gland
Week 4	Anterior pituitary gland
Week 5	Posterior pituitary gland
Week 6	thyroid gland and parathyroid gland
Week 7	parathyroid gland
Week 8	Mid exam
Week 9	The pancreas
Week 10	Adrenal gland
Week 11	Male reproductive system
Week 12	female reproductive system
Week 13	ELISA technique
Week 14	Estimation some hormone levels
Week 15	Results analysis of estimated hormone levels by ELISA

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	TEXTBOOK OF MEDICAL PHYSIOLOGY, Guyton, Arthur C., 2006 , pdf	Yes
Recommended Texts	Endocrine system 2: hypothalamus and pituitary gland , Nursing Times *online] June 2021 / Vol 117 pdf	No
Websites	https://www.endocrinology.org/about-us/what-is-endocrinology/	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-417		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Ayaa Abdlrahmaan Shuker	e-mail	Ayaa.A.s@meuc.edu.ig
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Ms.c.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<p>The aim is to strengthen students' learning to use English as a foreign language to help them enrich their knowledge and understanding of terms and phrases, and to strengthen their four skills (reading, writing, speaking, and listening). Learning English also helps them communicate with people around the world.</p> <p>The course teaches students how to use English grammar rules in conversation. It teaches students verbs (present, past, present continuous, and past continuous), the use of adjectives and adverbs, how to ask questions using verbs, and the use of question words. Students in the Department of Life Sciences are introduced to the rules, principles, concepts, vocabulary, and meanings of the English language, as detailed in the course description.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>A. Cognitive Objectives</p> <ol style="list-style-type: none">1. To be able to understand the material and use blended learning.2. To know and understand the course topics.3. To possess clarity in the cognitive aspect to reach a high level of sound scientific awareness.4. To acquire practical skills that qualify the student to perform the applied aspects of life sciences. <p>B. Course-Specific Skills Objectives</p> <ol style="list-style-type: none">1. To acquire the self-directed skills at the level of the required method.2. To acquire the required cognitive and intellectual skills.3. To acquire the required practical skills.4. To participate in discussions and dialogues using English vocabulary in the classroom.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Traditional teaching methods (lecture, discussion, observation, etc.), as well as the use of blended learning.</p> <p>Modern teaching methods (brainstorming, extracurricular skills).</p> <p>Modern educational technology.</p> <p>Self-learning and e-learning programs using multimedia technology via the internet.</p> <p>Assessment methods:</p> <ol style="list-style-type: none">A. Daily quizzes, oral exams, monthly exams, and term reports for theoretical material.B. Distribution of grades: For English language (20% for the first semester), (20% for the second semester) / 60% for the final exam.C. Allocating additional marks for classroom and extracurricular activities <p>C. Affective and Value-Based Objectives</p> <ol style="list-style-type: none">C1. Developing the student's awareness of the importance of the English language in daily and academic life

	<p>C2. Developing the ability to analyze, deduce, evaluate, and make judgments</p> <p>C2. Contributing to the student's intellectual, personal, and professional development</p> <p>C3. Enhancing and developing the student's positive attitude towards learning the English language</p> <p>C4. Developing the student's awareness of foreign cultures</p> <p>Teaching Methods</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>C. Affective and Value-Based Objectives</p> <p>C1. Developing the student's awareness of the importance of the English language in daily and academic life</p> <p>C2. Developing the ability to analyze, deduce, evaluate, and make judgments</p> <p>C2. Contributing to the student's intellectual, personal, and professional development</p> <p>C3. Enhancing and developing the student's positive attitude towards learning the English language</p> <p>C4. Developing the student's awareness of foreign cultures</p> <p>Teaching Methods</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	33	Structured SWL (h/w)	5
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	3

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)	50		
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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	Unit 1 Home and away
Week 2	Unit 2 Been there, done that !
Week 3	Discussion
Week 4	Unit 3 What a story

Week 5	Unit 4 Nothing but the truth
Week 6	Unit 5 An eye to the future
Week 7	Unit 6 Making it big
Week 8	Mid exam
Week 9	Unit 7 Getting on together
Week 10	Unit 8 Going to extremes
Week 11	Discussion
Week 12	Unit 9 Things ain't what they used to be!
Week 13	Unit 10 Risking life and limb
Week 14	Discussion
Week 15	Preparatory week before the final Exam
Week 16	Final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New-headway-plus-upper-intermediate-students-book. New-headway-plus-upperintermediate-students-workbook	No
Recommended Texts	المحاضرات المؤرشفة من قبل تدريسي الاختصاص لكل مادة ورقية كانت ام فديوية	No
Websites		

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Antibiotics		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-425		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farqad AbdIraheem AbdIftaah	e-mail	Farqad .A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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 Objectives أهداف المادة الدراسية	<p>Understanding the importance of antibiotics, the microorganisms that produce them, how they are manufactured, and their mechanisms of action against pathogenic microorganisms, particularly pathogenic bacteria, fungi, and others, as well as identifying their harmful side effects on humans.</p> <p>Developing students' abilities to investigate the effects of these antibiotics on pathogenic bacteria in the laboratory to select the appropriate antibiotic, given that some antibiotics affect Gram-positive bacteria, others Gram-negative bacteria, and some are effective against both types.</p>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>A. Knowledge and Understanding: Understanding how to select the appropriate antibiotic to kill or inhibit the growth of the pathogenic bacteria under test, along with understanding how to use the antibiotic correctly in various practical applications.</p> <p>B. Subject-Specific Skills: Knowing how to identify one or more antibiotics from a group of antibiotics to obtain the best laboratory results without resorting to the indiscriminate use of antibiotics.</p>
Indicative Contents المحتويات الإرشادية	<p>Teaching and Learning Methods:</p> <p>Using traditional lecture methods through in-person lectures and presentations, and utilizing alternative methods such as gathering information from scientific sources.</p> <p>Assessment Methods:</p> <p>Daily quizzes, midterm and final exams, and practical experiment reports.</p> <p>Thinking Skills:</p> <p>Assigning students survey tasks to investigate the most commonly used antibiotics in hospitals and private clinics and to study their effectiveness, taking into account their country of origin.</p>

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 as well as a series of lectures and Antibiotic classes designed to introduce you to it. At the same time refining and expanding their
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critical thinking skills through topics covered in lectures include what are Antibiotic, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic . Antibiotic

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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)		
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	History of Antibiotics: General Introduction
Week 2	Methods of Obtaining Antibiotics
Week 3	Sensitivity Testing Methods
Week 4	Classes of Antibiotics: Penicillins
Week 5	Classes of Antibiotics: Penicillins
Week 6	Cephalosporins
Week 7	Mid exam
Week 8	Aminoglycosides
Week 9	Cell Wall-Acting Antibiotics
Week 10	Plasma Membrane-Acting Antibiotics
Week 11	Second Midterm Exam
Week 12	Protein Synthesis Inhibiting Antibiotics
Week 13	Natural Resistance to Antibiotics
Week 14	Acquired Resistance to Antibiotics
Week 15	Antifungals
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Sensitivity Testing Methods
Week 2	Classes of Antibiotics: Penicillins
Week 3	Cephalosporins
Week 4	Aminoglycosides
Week 5	Cell Wall-Acting Antibiotics
Week 6	Plasma Membrane-Acting Antibiotics
Week 7	Second Midterm Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الزبيدي، حامد مجيد. 1988، علم الاحياء المجهرية النظري والعملي، جامعة بغداد	No
Recommended Texts	DR. Laurence, P. N. Bennett. 1992. clinical pharmacology. seventh edition. Claudio. O. Gualerzi. et. al., 2014. Antibiotics Targets, Mechanism and Resistance. Wiley-VCH co.	No
Websites	www.blackwellpublishing.com www.wiley.com	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Molecular Biology		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	Bio-411		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farqad AbdIraheem AbdIftaah	e-mail	Farqad A.A@meuc.edu.iq
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	None	e-mail	None
Scientific Committee Approval Date	01/10/2025	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

<p>Module Objectives أهداف المادة الدراسية</p>	<p>76. This class discusses the fundamental aspects of Molecular Biology. 77. its importance to mankind in a brief and articulate explanation of this newly originated science. 78. Highlights the general morphology, genetic structure, function of Molecular Biology . 79. Underlie the principles and application of Recombinant phage DNA technology in pharmaceutical, and biomedical fields.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>107. Discuss reasons for studying Molecular Biology 108. Outline methods for cultivation of Molecular Biology; purification of gene; detection of gene and their components; investigation of Molecular Biology gene function; assess the value of Molecular Biology genome sequencing. 109. Describe the modes of transmission of plant viruses and animal viruses; evaluate the roles of vectors in virus transmission; discuss the immune mechanisms encountered by an animal virus when it enters the body of a new host. 110. Explain the role of primers in gene nucleic acid synthesis; the roles of host proteins in Molecular Biology genome replication</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Molecular biology is the branch of biology that deals with the nature of biological phenomena at the molecular level through the study of the life molecules (DNA, RNA and proteins).</p> <p>DNA as a Genetic Material rather than Proteins: Classic Experiments</p> <p>I. Frederick Griffith: Bacterial Transformation In 1928, British bacteriologist Frederick Griffith conducted a series of experiments using <i>Streptococcus pneumoniae</i> bacteria and mice. Griffith wasn't trying to identify the genetic material, but rather, trying to develop a vaccine against pneumonia. In his experiments, Griffith used two related strains of bacteria, known as R and S.</p> <p>2. Avery, McCarty, and MacLeod: Identifying the transforming principle In 1944, three Canadian and American researchers; Avery, McCarty, and MacLeod, set out to identify Griffith's "transforming principle". To do so, they began with large cultures of heat-killed S cells and extracted the transforming principle by enzymatically destroying the other cellular components. By this method, they were able to obtain small amounts of highly purified transforming principle, which they could then analyse through other tests to determine its identity (Figure 2).</p> <p>Hershey-Chase experiments In their experiments, Hershey and Chase studied bacteriophages, viruses that attack bacteria and composed of outer structures made of proteins and an inner core</p>

consisting of DNA.

Discovering the Double Helix

By the early 1950s, considerable evidence had accumulated indicating that DNA was the genetic material of cells, and now the race was on to discover its threedimensional structure. Around this time, Austrian biochemist Erwin **Chargaff** (1905–2002) examined the content of **DNA** in different species and discovered that adenine, thymine, guanine, and cytosine were not found in equal quantities, and that it varied from species to species, but not between individuals of the same species. He found that the amount of adenine was very close to equalling the amount of thymine, and the amount of cytosine was very close to equalling the amount of guanine, or $A = T$ and $G = C$. These relationships are also known as

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 as well as a series of lectures and practical classes designed to introduce you to Molecular Biology. At the same time refining and expanding their critical thinking skills through topics covered in lectures include what are Molecular Biology, their basic characteristics, structure, classification, propagation, and quantification. An interactive tutorial and by considering types of simple experiments (Practical classes) offer training in basic Molecular.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)		Structured SWL (h/w)	
الحمل الدراسي المنتظم للطالب خلال الفصل	79	الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	الحمل الدراسي غير المنتظم للطالب أسبوعيا	6

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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	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 course
Week 2	DNA as a Genetic Material rather than Proteins: Classic Experiments
Week 3	The Molecular Composition of DNA
Week 4	DNA Molecular Structure
Week 5	DNA replication
Week 6	DNA Replication in Prokaryotes

Week 7	Mid-term Exam
Week 8	Chromosomes Structure: Chromatin
Week 9	Eukaryotic DNA Replication
Week 10	DNA Repair
Week 11	Other DNA damage repair mechanisms
Week 12	DNA proofreading and repair in human disease
Week 13	Transcription
Week 14	Transfer RNA
Week 15	Translation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety, Important of Molecular Biology diagnoses
Week 2	Lab 2: Introduction to microscopic techniques
Week 3	Lab 3: Isolation of DNA
Week 4	Lab 4: Isolation of RNA
Week 5	Lab 5: Isolation and cultivation of DNA Bacteria
Week 6	Lab 6: Detection of human nucleic acid
Week 7	Lab 7: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamental Molecular Biology . Lizabeth A. Allison 2007	No
Recommended Texts	Molecular Genetics of Bacteria Jeremy W. Dale Simon F. Park University of Surrey, UK	No
Websites	www.blackwellpublishing.com www.wiley.com	

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