



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 :

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

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

العميد

ا.د. متمرس مثنى علوان الجشعبي

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

التوقيع:

اسم رئيس القسم: أ.د. صالح عبد القادر عبدالله

التاريخ: 2025/10/1



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 كعالم 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		
<b>المستوى الثاني- الفصل الأول</b>				
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
<b>مجموع الوحدات</b>				
30				
<b>المستوى الثالث- الفصل الأول</b>				
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
<b>مجموع الوحدات</b>				
30				

30		مجموع الوحدات		
<b>المستوى الثاني- الفصل الثاني</b>				
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
<b>مجموع الوحدات</b>				
30				
<b>المستوى الثالث- الفصل الثاني</b>				
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
<b>مجموع الوحدات</b>				
30				

## 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 كتنريسي 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 البيولوجي	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 <a href="mailto:J.sabr@meuc.edu.iq">J.sabr@meuc.edu.iq</a>
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"><li>1. The chemical separation methods course is determined according to the study plan prepared in the Applied Chemistry Department.</li><li>2. The course aims to introduce students to the general concepts of chemical separation methods used in chemical measurements</li></ol>

	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.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	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.
<b>Indicative Contents</b> المحتويات الإرشادية	<b>A- Methods of teaching and learning</b> 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>B- Evaluation methods</b> 1- Daily and monthly exams 2- Duties 3- In-class exercises

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

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

### Module Evaluation

تقييم المادة الدراسية

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

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	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	
<b>Recommended Texts</b>	Approach To Modern Separation Techniques. by C-Zhou, E Almatrafi, X Tang, B Shao, W Xia... (Ph.D) (Author), 2022	No
<b>Websites</b>	<a href="https://www.sciencedirect.com/journal/separation-and-purification-technology/vol/292/suppl/C">https://www.sciencedirect.com/journal/separation-and-purification-technology/vol/292/suppl/C</a> <a href="https://www.amazon.com/Separation-Purification-Methods-Edmond-Perry/dp/082476319X">https://www.amazon.com/Separation-Purification-Methods-Edmond-Perry/dp/082476319X</a>	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A – Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D – Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E – Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<a href="mailto:Alaa.M@muec.edu.iq">Alaa.M@muec.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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><b>Strategies</b></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>
--------------------------	---

- 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

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

### 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
<b>Total assessment</b>			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	<b>first-term Exam</b>
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	<b>final-term Exam</b>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A – Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 – 89	Above average with some errors
	<b>C – Good</b>	جيد	70 – 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 – 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 – 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<a href="mailto:Farid.m.mahdi@meuc.edu.iq">Farid.m.mahdi@meuc.edu.iq</a>
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><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>1. Identify the foundations and systems of physics and link them to daily life activities and human activities</li><li>2. Knowledge of vector and scalar quantities and the basic units of physics. Study and transform vectors, and addition, subtraction and multiplication of vectors.</li><li>3. Study of movement in one dimension and calculate the acting forces and their resultant</li><li>4. Study of simple harmonic motion, heat, heat quantity, friction, electricity, energy, and work, and their relationship to living organisms.</li></ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>5- A- Cognitive objectives</li><li>6- A- 1 . Improving the level of comprehension (comprehension) developing the ability to interpret, predict and conclude</li><li>7- A- 2 . Application capabilities development</li><li>8- A-3. Providing the student with the ability to analyze</li><li>9- A-4. Develop the student's ability to integrate ideas and information (synthesis level), which is the opposite of analysis</li><li>10- A- 5. Evaluation: Developing the student's ability to make a judgment on the value of the material learned</li><li>11- B- The skills objectives of the course</li><li>12- B 1 . Improving the student's ability to observe</li><li>13- B-2. To learn how to imitate and imitate.</li><li>14- B-3. To learn the method of experimentation</li></ol>
<p><b>Indicative Contents</b></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"><li>1. Teaching the student oral and written communication skills</li><li>2. Using modern technological tools, such as computers, the Internet, and scientific programs for preparing reports, tables, figures, and presentations.</li><li>3. Encouraging the student to work collectively within a work team</li><li>4. Developing the student's abilities to make optimal use of time (time management).</li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	10% (10)	Same week	LO #1, #3, #7, #9, #11, #13
	<b>Assignments</b>	5	10% (10)	Each following week	LO #2, #4, #6, #8, #10, #12

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

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

### 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
<b>Success Group</b> <b>(50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<a href="mailto:Marwa.A@meuc.edu.iq">Marwa.A@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Study the principles of computer science and information technology</li><li>2. Study different types of modern computers</li><li>3. Introducing the student to the most important components of the computer and its systems</li><li>4. Identify the types of computers used in various scientific fields</li><li>5. Identify the different types of operating systems used in computers</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. The student's knowledge of the main principles of computer science and information technology</li><li>2. Understand the different types of computers used in various fields</li><li>3. Knowing the most important components of a computer and what its parts are</li><li>4. Know how to manage and store data inside a computer</li><li>5. Knowledge of the most important operating systems used in computers</li><li>6. Know the most important computer applications used in various magazines</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>The student studies the following most important topics:</p> <ol style="list-style-type: none"><li>1. Stages of computer development, in addition to a brief history of the most important ancient computers (6 hours)</li><li>2. General concepts in computer science in terms of types of data and methods of storing them inside the computer (5 hours)</li><li>3. Computer uses in addition to its various types (5 hours)</li><li>4. Study the physical components in detail and identify their most important components (8 hours)</li><li>5. Programming components and applications used in computers (8 hours)</li><li>6. Study numbering systems for computer science and learn about the most important ones (7 hours)</li><li>7. Calculating storage space for the primary memory and secondary memory (7 hours)</li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

### Module Evaluation

تقييم المادة الدراسية

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

### Delivery Plan (Weekly Syllabus)

## المنهاج الاسبوعي النظري

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

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

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

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

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

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

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A</b> - Excellent	امتياز	90 – 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 – 89	Above average with some errors
	<b>C</b> – Good	جيد	70 – 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 – 59	Work meets minimum criteria
<b>Fail Group</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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 href="mailto:A.shukur@meuc.edu.iq">A.shukur@meuc.edu.iq</a>
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			
--	--	--	--

## أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> 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.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Students will increase their awareness of correct usage of English grammar in writing and speaking.</li> <li>2. Improve their speaking ability in English both in terms of fluency and comprehensibility.</li> <li>3. Receive feedback on their performance through oral presentations.</li> <li>4. Increase their reading speed and comprehension of academic articles.</li> <li>5. improve their reading fluency skills through extensive reading.</li> <li>6. Expand their vocabulary by keeping a vocabulary journal.</li> <li>7. strengthen their ability to write academic papers, essays and summaries using the process approach.</li> </ol>
<b>Indicative Contents</b> 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

<b>Strategies</b>	<ol style="list-style-type: none"> <li>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</li> </ol>
-------------------	---

- 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

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

### Module Evaluation

تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Unit-1 (Hello)
<b>Week 2</b>	Unit-2 (Your world)
<b>Week 3</b>	Unit-3 (Personal information)
<b>Week 4</b>	Unit-4 (Family and friends)
<b>Week 5</b>	Unit-5 (It's my life)
<b>Week 6</b>	Unit-6 (Every day)
<b>Week 7</b>	<b>Mid-term Exam</b>
<b>Week 8</b>	Unit-7 (Places I like)
<b>Week 9</b>	Unit-8 (Where I live)
<b>Week 10</b>	Unit-9 (Happy birthday)
<b>Week 11</b>	Unit-10 (We had a good time)
<b>Week 12</b>	Unit-11 (we can do it)
<b>Week 13</b>	Unit-12 (Thank you very much)
<b>Week 14</b>	Unit-13 (Here and now)
<b>Week 15</b>	Unit-14 (It's time to go)
<b>Week 16</b>	<b>final-term Exam</b>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 – 49)</b>	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	<a href="mailto:osama.qasim@meuc.edu.iq">osama.qasim@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1- Giving the student a historical overview of botany and its branches</li><li>2. The relationship of botany to other sciences</li><li>3. The benefits of the plant for life and the environment botany components</li><li>4. , types and locations</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Teaching the student the nature of plant growth and its diagnosis</li><li>2. Knowing the parts of a plant through its apparent appearance</li><li>3. Knowing the different parts of the plant from an anatomical perspective</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1. Study of the morphological characteristics of plants</li><li>2. Study of the diagnosis of the plant reproduction process</li><li>3. Study of plant nutrition</li><li>4. Study of types of tissues</li><li>5. 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.</li></ol>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	--

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	137	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	9
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>200</b>		

### Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	10% (10)	Same week	1, 3, 5,7,9
	<b>Assignments</b>	5	10% (10)	Each week	2, 4,6,8,10
	<b>Projects</b>	1	10% (10)	10	Each week
	<b>Report/ Lab.</b>	5	10% (10)	3, 6, 8,10,12	3, 5,7,9,11
<b>Summative assessment</b>	<b>Midterm Exam</b>	1hr	10% (10)	7	1, 2, 3,4,5,6
	<b>Final Exam</b>	3hr	50% (50)	16	All weeks
<b>Total assessment</b>			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

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<a href="mailto:Shahad.wadhah@meuc.edu.iq">Shahad.wadhah@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1- Develop an understanding of the diversity of animal life and an appreciation of the significance of various taxa.</li><li>2- Demonstrate a basic understanding of the evolutionary history of the animal kingdom.</li><li>3- Develop an understanding of the form and function of animal systems.</li><li>4- Develop laboratory skills necessary for zoological study.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1- Have developed an understanding of the diversity of animal life and an appreciation of the significance of various taxa.</li><li>2- Have developed a basic understanding of the evolutionary history of the animal kingdom.</li><li>3- Develop an understanding of the form and function of animal systems.</li><li>4- Develop laboratory skills necessary for zoological study.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Zoology course covers three main themes: Comparative physiology - the functional characteristics of animals; Evolutionary biology - how animals adapt to their environment, and their genetics, Behaviour, ecology and conservation - how animals interact with their environment and each other to support biodiversity on the planet. 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. 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

<b>Strategies</b>	<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>
-------------------	---

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	94	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>200</b>		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	10% (10)	Same week	1, 2, 3, 4
	<b>Assignments</b>	5	10% (10)	Each following week	1, 2, 3, 4
	<b>Projects / Lab.</b>	5	10% (10)	2,4,6,8,12	1, 2, 3, 4
	<b>Report</b>	2	10% (10)	6, 10	3, 4
<b>Summative assessment</b>	<b>Midterm Exam</b>	1hr	10% (10)	7	1, 2, 3
	<b>Final Exam</b>	3hr	50% (50)	16	1, 2, 3, 4
<b>Total assessment</b>			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

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<a href="mailto:Mahdia.s.hassan@meuc.edu.iq">Mahdia.s.hassan@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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>
<b>Module Learning Outcomes</b> 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>
<b>Indicative Contents</b> 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

<b>Strategies</b>	<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>
-------------------	--

## Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
<b>Total SWL (h/sem)</b>	<b>50</b>		
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
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>General Mathematics</b>		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	<b>COS-111</b>		
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	<a href="mailto:Farid.m.mahdi@meuc.edu.iq">Farid.m.mahdi@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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>
<b>Module Learning Outcomes</b> 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>
<b>Indicative Contents</b> 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

<b>Strategies</b>	<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>
-------------------	--

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

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

### Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	10% (10)	Continues	
	<b>Assignments</b>	5	10% (10)	Continues	
	<b>Projects / Lab.</b>	1	10% (10)	10	
	<b>Report</b>	2	10% (10)	4,10	
<b>Summative assessment</b>	<b>Midterm Exam</b>	1	10% (10)	7	
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			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
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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 <a href="mailto:J.sabr@meuc.edu.iq">J.sabr@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1- Introduce the student to the types of bonds in organic compounds</li><li>2- Introducing the student to methods of preparation, properties and reactions of alkanes</li><li>3- Introducing the student to the methods of preparation, properties and reactions of alkynes and alkenes</li><li>4- Introducing the student to the methods of preparation, properties, and reactions of alkyl halides, alcohols, and carboxylic acids</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1-The student knows the types of hybridization and chemical bonds in organic compounds</li><li>2- The student knows how to write reaction equations and preparation methods for some of the studied compounds</li><li>3- The student knows how to write and name the organic compounds studied in the course according to international rules</li><li>4- The student's knowledge of methods for preparing the organic compounds studied theoretically and practically</li><li>5- The student's knowledge of methods for separating and purifying organic materials theoretically and practically</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1-Developing the student's ability to deal with modern technical means</li><li>2- Developing the student's ability to deal with the Internet</li><li>3- Developing the student's ability to deal with multiple media</li><li>4- Developing the student's ability to dialogue and discuss</li></ol>

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	---

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

### Module Evaluation

تقييم المادة الدراسية

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

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	<b>Structure and bonding</b>
<b>Week 2</b>	<b>Hybridization and Isomers</b>
<b>Week 3</b>	<b>Functional Group</b>

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?
<b>Required Texts</b>	<b>Organic chemistry Morrison and Boyd</b>	Yes
<b>Recommended Texts</b>	Organic Chemistry By Graham and Selmi	No
<b>Websites</b>	Organic chemistry Francis Carey	

## Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - 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 <a href="mailto:m.mahdi@meuc.edu.iq">m.mahdi@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Know the types of distributions and focus on the normal distribution of data.</li><li>2. Learn about determining the sufficient number of samples according to the data dispersion system.</li><li>3. Knowledge of the most important statistical tests used in biological research</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Enabling the student to choose the appropriate statistical analysis for the research problem.</li><li>2. Enabling the student to conduct factorial and non-factorial tests.</li><li>3. The skill of applying what the student learns during the course in his future professional life.</li><li>4. Skill in analyzing variation in biometrics.</li></ol>
<b>Indicative Contents</b> 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

<b>Strategies</b>	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.
-------------------	---

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	48	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	3
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	5	10% (10)	Continues	1,2,3,4,5,6,7,8,9,10,11,12
	<b>Assignments</b>	5	10% (10)	Continues	1,2,3,4,5,6,7,8,9,10,11
	<b>Projects</b>	1	10% (10)	12	All
	<b>Report/ Lab.</b>	2	10% (10)	4,10	1,2,3,4,5,6,7,8,9,10
<b>Summative assessment</b>	<b>Midterm Exam</b>	1	10% (10)	7	1,2,3,4,5,6
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			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	<b>final Exam</b>

## 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
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - 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	<a href="mailto:Saleh.A.A@meuc.edu.iq">Saleh.A.A@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	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.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	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.
<b>Indicative Contents</b> المحتويات الإرشادية	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

<b>Strategies</b>	1.Monthly and semi-semester exams. 2. Direct short tests (Quiz) or electronic ones using (Quiz) Google Form.
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	33	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

## 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

<b>Week 15</b>	Warning and advisory signs
<b>Week 16</b>	final Exam

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

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

### Grading Scheme

#### مخطط الدرجات

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

<b>Module Objectives</b> 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>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1 .Describe the structural and functional differences that exist among all microorganisms.</li><li>2 .Apply fundamental principles of life chemistry to microbial metabolism and physiology.</li><li>3 .Evaluate the impact of microorganisms in their native settings on biosphere maintenance.</li><li>4 .Compare and contrast the interactions of microbes with hosts in health and disease.</li><li>5 .Identify important microbial relationships and demonstrate how these interactions affect plant and animal health.</li><li>6 .Describe the fundamental ideas underpinning the methods employed to restrict microbial development.</li><li>7 .Explain the flow and control of genetic information, as well as its impact on the evolution of life on Earth.</li><li>8 .Investigate the use of bacteria in water safety and food production.</li></ol>
<b>Indicative Contents</b> 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

<b>Strategies</b>	The course grade will be based on exams, in-class participation & group work and homework assignments
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## Module Evaluation

### تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

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

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A – Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E – Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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 href="mailto:A.A.@meuc.edu.iq">A.A.@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Comparative characteristics of microbial organisms</li><li>2. General bacteriology and microbial techniques.</li><li>3. Microbial metabolism and enzymes.</li><li>4. Physical and chemical microbial control</li><li>5. Collection and handling of laboratory specimens.</li><li>6. Microbial genetics, mutation and biotechnology.</li><li>7. Pathogenicity, virulence, and epidemiology</li><li>8. Disease transmission and control of nosocomial infections</li><li>9. Body defenses, immunology, and hypersensitivity</li><li>10. Common bacterial, fungal, and viral diseases.</li><li>11. Experimentation in clinical scenarios.</li></ol>
<b>Indicative Contents</b> 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

<b>Strategies</b>	The course grade will be based on exams, in-class participation & group work and homework assignments
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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

## Module Evaluation

### تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

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

## 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	<a href="http://www.pearsonhighered.com">www.pearsonhighered.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	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
<b>Fail Group</b> <b>(0 - 49)</b>	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	
Administering Department	Bio	College	Meddle East University
Module Leader	Osama Qasim Abdulameer		e-mail <a href="mailto:osama.qasim@meuc.edu.iq">osama.qasim@meuc.edu.iq</a>
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><b>Module Objectives</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>5. understanding the diversity of plant anatomy between different plants.</li><li>6. Demonstrate a basic understanding of the evolutionary history of the plant tissue.</li><li>7. understanding the form and function of plant tissue.</li><li>8. Developing the laboratory skills necessary to study the anatomy of plant tissues.</li></ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>4. Have developed an understanding of the diversity of plant anatomy and an appreciation of the significance of various taxa.</li><li>5. Have developed a basic understanding of the evolutionary history of the plant tissue.</li><li>6. Develop an understanding of the form and function of plant tissue.</li><li>7. Develop laboratory skills necessary to study the anatomy of plant and its parts.</li></ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>Plant anatomy course covers three main themes:</p> <ul style="list-style-type: none"><li>• 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</li><li>• 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.</li><li>• 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</li></ul>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## Module Evaluation

### تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

مخطط الدرجات (يترك بدون أي تغيير)

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX - Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F - Fail</b>	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	<b>Plant Taxonomy</b>		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	<b>Bio-222</b>		
ECTS Credits	5		
SWL (hr/sem)	<b>125</b>		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Osama Qasim Abdulameer	e-mail	<a href="mailto:osama.qasim@meuc.edu.iq">osama.qasim@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Definition of plant taxonomy and its relationship to other sciences.</li><li>2. Study of the vegetative structure of plants.</li><li>3. Study of the reproductive structures of plants.</li><li>4. Identification, isolation and classification of plant species of different plant families</li></ol>
<b>Module Learning Outcomes</b> 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"><li>1. Understanding the vegetative and reproductive structures of different plants.</li><li>2. Knowing the methods of collecting plants and methods of diagnosing them.</li><li>3. Knowing the differences between flowering, seed, dicotyledonous and monocotyledonous plants.</li><li>4. Conducting field trips to teach students how to collect plant samples</li><li>5. Identifying plant species and identifying the plant families to which they belong.</li><li>6. 3- Drying and preserving plant samples for long periods</li></ol>
<b>Indicative Contents</b> 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

<b>Strategies</b>	<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>
-------------------	---

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

### Module Evaluation

تقييم المادة الدراسية

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

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

<b>Week 13</b>	Project
<b>Week 14</b>	Project
<b>Week 15</b>	Project

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

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

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - 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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>6. Study the principles of computer science and information technology</li><li>7. Study different types of modern computers</li><li>8. Introducing the student to the most important components of the computer and its systems</li><li>9. Identify the types of computers used in various scientific fields</li><li>10. Identify the different types of operating systems used in computers</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. The student's knowledge of the main principles of computer science and information technology</li><li>2. Understand the different types of computers used in various fields</li><li>3. Knowing the most important components of a computer and what its parts are</li><li>4. Know how to manage and store data inside a computer</li><li>5. Knowledge of the most important operating systems used in computers</li><li>6. Know the most important computer applications used in various magazines</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>The student studies the following most important topics:</p> <ol style="list-style-type: none"><li>1. Stages of computer development, in addition to a brief history of the most important ancient computers (6 hours)</li><li>2. General concepts in computer science in terms of types of data and methods of storing them inside the computer (5 hours)</li><li>3. Computer uses in addition to its various types (5 hours)</li><li>4. Study the physical components in detail and identify their most important components (8 hours)</li><li>5. Programming components and applications used in computers (8 hours)</li><li>6. Study numbering systems for computer science and learn about the most important ones (7 hours)</li><li>7. Calculating storage space for the primary memory and secondary memory (7 hours)</li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## Module Evaluation

### تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

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

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - 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	<a href="mailto:Ranem.Mohammed@meuc.edu.iq">Ranem.Mohammed@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1 Identify and distinguish types of insects.</li><li>B. The student will be able to distinguish between beneficial and harmful insects.</li><li>c. The possibility of dealing with insects in a scientific way.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>7. Know the terminology used in entomology</li><li>8. The possibility of classifying insects scientifically and can distinguish different species and learn about their environment</li><li>9. Breeding insects in laboratories</li><li>10. pest control</li><li>11. How to deal with insects</li><li>12. methods of collecting insects</li><li>13. Methods of hardening and collecting insects</li><li>14. Delivering information to society in a scientific way</li><li>15. Identify the areas where insects are found</li></ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	---

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

## Module Evaluation

تقييم المادة الدراسية

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

<b>Week 6</b>	Lab 6: Diptera and Neuroptera.
<b>Week 7</b>	Lab 7: Coleoptera and Isoptera.

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	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
<b>Recommended Texts</b>	- PRACTICAL MANUAL CLASSIFICATION OF INSECTS(( Prof. Neerja Agrawal Emeritus Professor (ICAR) 2021))	No
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> (0 – 49)	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>Parasitology</b>		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	<b>Bio-223</b>		
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	<a href="mailto:Ranem.mohammed@meuc.edu.iq">Ranem.mohammed@meuc.edu.iq</a>
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><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Realize the importance of parasitology.</li> <li>2. Understand the scope and principles of parasitology.</li> <li>3. Recognize parasitic criteria, adaptations and requirements from their hosts.</li> <li>4. Illustrate the main parasitic animals with their life cycles.</li> <li>5. Realize the impact of parasites on human health and economy.</li> <li>6. Define the scope and importance of immunology.</li> <li>7. Recognize the principles and types of immunity.</li> <li>8. Identify the mechanisms of immune response.</li> <li>9. Discuss the disorders of the immune system and their pathogenic impacts</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>A. Knowledge and understanding             <ol style="list-style-type: none"> <li>1 - Parasitology: - Demonstrate the taxonomic affiliation of specific parasitic examples.</li> <li>2 - Discuss the adaptations of parasites and their host specificity.</li> <li>3 - Compare the life cycles of various parasites.</li> </ol> </li> <li>B. mental skills             <ol style="list-style-type: none"> <li>1-Dissect selected parasitic examples.</li> <li>2 - Identify the economic and medical losses due to parasitic infections.</li> <li>3 - Gain the practical skills of identifying, classifying and drawing parasitic examples.</li> </ol> </li> <li>C. Professional skills             <ol style="list-style-type: none"> <li>1 - Immunology: -Correlate the immune disorders with certain pathological manifestation.</li> <li>2 - Discuss the relation of immunity with allergy and environmental factors</li> </ol> </li> <li>D. General skills             <ol style="list-style-type: none"> <li>1 - Show the risk factors autoimmunity and the acquired immunity defecincy syndrome (AIDS) et</li> </ol> </li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ol style="list-style-type: none"> <li>1-Introducing parasitology</li> <li>2-Medical veterinary and economic importance</li> <li>3- Parasitic association, criteria and requirements</li> <li>4- Host-parasitic relationships.</li> <li>5- Survery of various taxa of parasites with life cycles of specific examples from: Protozoa-platyhelmenthes-nematodes-acanthocephala-arthropoda</li> <li>6- Emphasis on local and human parasites with their distinctive features, impacts and control measures</li> <li>7-Introducing immunology - Principles of immunology</li> </ol>

	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.
--	--

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

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

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<a href="mailto:Ranem.mohammed@muec.edu.iq">Ranem.mohammed@muec.edu.iq</a>
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

<b>Module Objectives</b> 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
<b>Module Learning Outcomes</b> 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

<b>Strategies</b>	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.
-------------------	--

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b>	63	<b>Structured SWL (h/w)</b>	4
-------------------------------	----	-----------------------------	---

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

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

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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

<b>Week 13</b>	Distinguish between genders
<b>Week 14</b>	Quizzes
<b>Week 15</b>	Assignments
<b>Week 16</b>	Projects

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	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
<b>Recommended Texts</b>	- PRACTICAL MANUAL CLASSIFICATION OF INSECTS(( Prof. Neerja Agrawal Emeritus Professor (ICAR) 2021))	No
<b>Websites</b>		

### Grading Scheme

#### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Biochemistry I</b>		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	<a href="mailto:Zainab.J.S@muec.edu.iq">Zainab.J.S@muec.edu.iq</a>
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><b>Module Objectives</b></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"><li>1. Introduction to Biochemistry: Understand the scope, importance, and basic principles of biochemistry as a scientific discipline.</li><li>2. Structure and Function of Biomolecules: Explore the structure, properties, and functions of biomolecules, including proteins, carbohydrates, lipids, and nucleic acids.</li><li>3. carbohydrate</li><li>4. 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.</li><li>5. lipids.</li><li>6. Enzymes.</li><li>7. Hormones.</li><li>8. Vitamins and Minerals.</li></ol> <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><b>Module Learning Outcomes</b></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"><li>1. Carbohydrate Metabolism: Study the metabolism of carbohydrates, including glycolysis, gluconeogenesis, glycogen metabolism, and the regulation of blood sugar levels.</li><li>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.</li><li>3. Lipid Metabolism: Explore the metabolism of lipids, including fatty acid oxidation, lipogenesis, cholesterol metabolism, and the role of lipids in cellular membranes.</li><li>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.</li><li>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.</li><li>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.</li><li>6. Techniques in Biochemistry: Familiarize yourself with common laboratory techniques used in biochemistry, such as chromatography, electrophoresis,</li></ol>

	<p>spectrophotometry, and molecular biology techniques.</p> <p>7. Biochemical Techniques and Applications: Learn about the applications of biochemistry in various fields, including medicine, biotechnology, pharmacology, and environmental science.</p>
<p><b>Indicative Contents</b></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"> <li>1. Introduction to Biochemistry: <ul style="list-style-type: none"> <li>- Definition and scope of biochemistry</li> <li>- Historical overview of biochemistry</li> <li>- Importance and applications of biochemistry</li> </ul> </li> <li>2. Biomolecules: <ul style="list-style-type: none"> <li>- Structure, properties, and functions of proteins</li> <li>- Structure, properties, and functions of carbohydrates</li> <li>- Structure, properties, and functions of lipids</li> <li>- Structure, properties, and functions of nucleic acids</li> </ul> </li> <li>3. Protein Structure and Function: <ul style="list-style-type: none"> <li>- Primary, secondary, tertiary, and quaternary structure of proteins</li> <li>- Protein folding and stability</li> <li>- Enzymes and enzyme kinetics</li> <li>- Regulation of enzyme activity</li> </ul> </li> <li>4. Carbohydrate classifications and reactions:</li> <li>5. Enzymes</li> <li>6. Hormones:</li> <li>7. Vitamins and Minerals</li> </ol>

<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>	
<p><b>Strategies</b></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"> <li>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.</li> </ol>

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

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

### 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	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	<b>Mid-term Exam</b>
Week 9	Introduction and principle of lipids

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	A - Excellent	امتياز	<b>90 - 100</b>	<b>Outstanding Performance</b>
	B - Very Good	جيد جدا	<b>80 - 89</b>	<b>Above average with some errors</b>
	C - Good	جيد	<b>70 - 79</b>	<b>Sound work with notable errors</b>
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>Biochemistry II</b>		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	<b>Bio-225</b>		
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	<a href="mailto:Zainab.J.Subar@muec.edu.iq">Zainab J.Subar@muec.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<b>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.</b>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<b>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</b>
<b>Indicative Contents</b> المحتويات الإرشادية	<b>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.</b>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<b>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.</b>
-------------------	---

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	<b>63</b>	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	<b>4</b>
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	<b>37</b>	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	<b>2.5</b>
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

### Module Evaluation

تقييم المادة الدراسية

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

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

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

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

	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.
--	---

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

### Student Workload (SWL)

#### الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 – 49)</b>	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 href="mailto:A.sh.@meuc.edu.iq">A.sh.@meuc.edu.iq</a>
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><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"><li>5. Its aim is to strengthen students' education in using English as a foreign language in order to help them enrich</li><li>6. their knowledge and understanding of terms and phrases and strengthen their four skills (reading, writing and speaking).</li><li>7. And listening).. Also, learning English helps them communicate with different people around the world.</li><li>8. ☑ Teaching the student how to use English grammar in conversation</li><li>9. ☑ 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</li></ol> <p>☑ Introduce students to the rules, principles, concepts, vocabulary and meanings of the English language according to the prescribed curriculum.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"><li>8. Students will increase their awareness of correct usage of English grammar in writing and speaking.</li><li>9. Improve their speaking ability in English both in terms of fluency and comprehensibility.</li><li>10. Receive feedback on their performance through oral presentations.</li><li>11. Increase their reading speed and comprehension of academic articles.</li><li>12. improve their reading fluency skills through extensive reading.</li><li>13. Expand their vocabulary by keeping a vocabulary journal.</li><li>14. strengthen their ability to write academic papers, essays and summaries using the process approach.</li></ol>
<p><b>Indicative Contents</b></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

<b>Strategies</b>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Teach language skills across all curriculum topics</li> <li>3. Speak slowly and be patient: Speaking in a slower, measured cadence Being a bit more aware of your pronunciation</li> <li>4. Prioritize “productive language”</li> <li>5. Using a variety of methods to engage learning</li> <li>6. Using visual aids by the use of pictures, diagrams, charts and other visual tools.</li> <li>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.</li> <li>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.</li> <li>9. Build in some group work.</li> <li>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</li> </ol>
-------------------	--

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## 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

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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 <a href="mailto:M.@meuc.edu.iq">M.@meuc.edu.iq</a>
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><b>Module Objectives</b> 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><b>Module Learning Outcomes</b> 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><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>القران الكريم- سورة الملك ، الآيات 1-10 ، القواعد، المبتدأ والخبر الأدب- مصطلح الأدب والعصور الأدبية الإملاء- كتاب الهزمة 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><b>Strategies</b></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>
--------------------------	---

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	<b>first-term Exam</b>
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	<b>final-term Exam</b>

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 – 49)</b>	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	<b>Plants groups</b>		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	<b>Bio-216</b>		
ECTS Credits	5		
SWL (hr/sem)	<b>125</b>		
Module Level	2	Semester of Delivery	
Administering Department	Bio	College	Meddle East University
Module Leader	Osama Qasim abdlameer	e-mail	Osama <a href="mailto:qasim@meuc.edu.iq">qasim@meuc.edu.iq</a>
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><b>Module Objectives</b> أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> <li>10. Identify the different types of plants groups and distinguish between vascular and non-vascular plants.</li> <li>11. Study of cyanophyta and eukaryotic algae and their role in the environment.</li> <li>12. Understanding the life cycles of algae, their types, and distinguishing between different generations of the same algae</li> <li>13. Identify the different algae parts and their modifications</li> <li>14. Study the mechanisms of sexual and asexual reproduction in different algae groups.</li> </ol>
<p><b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Identify the most important plant groups and species in nature, their characteristics, and methods of reproduction and living.</li> <li>2. Methods of feeding various plant groups (algae, ferns, mosses), their sexual and asexual reproduction, growth, nutritional needs, and methods of producing spores.</li> <li>3. Knowing the most important functions that take place at the different tissues.</li> <li>4. Know its different types</li> <li>5. Understanding the mechanisms of sexual and asexual reproduction in different divisions</li> <li>6. Identify the most important events that take place during the life cycle.</li> <li>7. Microscopic examination of many samples from different places</li> <li>8. Learn to prepare slides for various samples.</li> </ol>
<p><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p>plants Groups course covers four main themes:</p> <p><b>Importance:</b> study of its importance from various medical, economic, agricultural, and environmental aspects.</p> <p><b>Classification:</b> Dividing algae into groups according to the degree of similarity between them in genetic components and morphology</p> <p><b>External morphology:</b> Studying the external structure of algae and its various parts</p> <p><b>Their nutrition and life cycles:</b> 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><b>Strategies</b></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>
--------------------------	--

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

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

### Module Evaluation

تقييم المادة الدراسية

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

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

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<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
<b>Recommended Texts</b>		No
<b>Websites</b>	<p>-<a href="https://www.britannica.com">https://www.britannica.com</a></p> <p>-<a href="https://www.vcbio.science.ru.nl/en/virtuallessons/redalgae">https://www.vcbio.science.ru.nl/en/virtuallessons/redalgae</a></p> <p>- <a href="http://micro.magnet.fsu.edu/featuredmicroscopist/vanegmond/chroococcussmall.html">http://micro.magnet.fsu.edu/featuredmicroscopist/vanegmond/chroococcussmall.html</a></p>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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 <a href="mailto:Hassan@meuc.edu.iq">Hassan@meuc.edu.iq</a>
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><b>Module Objectives</b></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 وضمن 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><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>أظهر 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><b>Indicative Contents</b></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><b>Strategies</b></p>	<p>القاء المحاضرات، استخدام طريقة النقاش والحوار، العصف الذهني، الاختبارات . السريعة</p>
--------------------------	--

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

### Module Evaluation

تقييم المادة الدراسية

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

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (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
<b>Fail Group</b> (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 الثالث

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Animal Physiology</b>		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	<b>Bio-323</b>		
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	<a href="mailto:Rasha.M.A@meuc.edu.iq">Rasha.M.A@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. have an enhanced knowledge and appreciation of mammalian physiology.</li> <li>2. understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems.</li> <li>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.</li> <li>4. be able to perform, analyses and report on experiments and observations in physiology.</li> <li>5. be able to recognize and identify principal tissue structures.</li> <li>6. Identify the mechanisms of neuromuscular coordination and the mechanics of homeostasis.</li> <li>7. Distinguish between types of endocrine glands by location, composition and hormone production.</li> <li>8. Knowledge of the most important hormonal disorders that occur in the organism, their causes and health symptoms.</li> <li>9. Understanding the physiology of reproduction and the stages of sexual maturity in both sexes</li> </ol>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part (1)</p> <p><b>Introduction of physiology:</b></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 &amp; function, mechanisms of membrane transport and cell to cell communication.[ 4 hrs]</p> <p><b>Systems:</b></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>
--	---

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (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
<b>Fail Group</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Cell Biology</b>		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	<b>Bio-311</b>		
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	<a href="mailto:Shahad.wadhah@mec.edu.iq">Shahad.wadhah@mec.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles</li><li>2. Students will understand how these cellular components are used to generate and utilize energy in cells</li><li>3. Students will understand the cellular components underlying mitotic cell division.</li><li>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.</li></ol>
<b>Module Learning Outcomes</b> 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"><li>1. Know and understand cell morphology</li><li>2. ultrastructure and function</li><li>3. cell cycle and proliferation</li><li>4. Understanding the cellular membrane system and the mechanisms of transport of substances across membranes</li><li>5. Understanding the energy release pathway in the mitochondrial organelle</li><li>6. Types of endoplasmic reticulum and their functions</li><li>7. Study of plastids and their types and understand the process of photosynthesis</li><li>8. Learn about the structure and function of chromosomes</li><li>9. Identify the genetic material and types of nucleic acids</li><li>10. Understanding the mechanisms and stages of cell division</li></ol>
<b>Indicative Contents</b> 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 &amp; function, mechanisms of membrane transport and cell to cell communication. [4 hrs.]</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Ecology</b>		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	<b>Bio-322</b>		
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	<a href="mailto:Farid.m.mahdi@meuc.edu.iq">Farid.m.mahdi@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Introduce students to the fundamental concepts and terminology of ecology.</li><li>2. Explain the interactions between living organisms and their environments.</li><li>3. Understand the role of biotic and abiotic factors in shaping ecosystems.</li><li>4. Study the impact of human activities on the environment and natural resources.</li><li>5. Develop scientific skills for analyzing environmental problems and proposing solutions.</li><li>6. Promote environmental awareness and responsibility for protecting ecosystems.</li><li>7. Learn strategies for sustainability and biodiversity conservation.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Explain the fundamental concepts and terminology of ecology.</li><li>2. Analyze the interactions between organisms and their biotic and abiotic environments.</li><li>3. Evaluate the impact of human activities on ecosystems and natural resources.</li><li>4. Apply scientific methods to study environmental problems and propose appropriate solutions.</li><li>5. Use environmental data to prepare scientific reports and analyses.</li><li>6. Demonstrate environmental awareness and responsibility in daily and professional practices.</li><li>7. Propose strategies for biodiversity conservation and achieving environmental sustainability.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1. Introduction to Ecology Define ecology, its history, and explain why it is essential to understand nature and human life.</li><li>2. Basic Concepts Describe ecosystems and their components; differentiate between biotic (living) and abiotic (non-living) factors.</li><li>3. Interactions Among Organisms Explain how organisms obtain food (food chains/webs) and how they relate (mutualism, predation, competition).</li><li>4. Biogeochemical Cycles Present the movement of essential materials like water, carbon, and nitrogen in nature and their role in life continuity.</li><li>5. Biodiversity and Geographic Distribution Explain the levels of biodiversity (genes, species, ecosystems) and factors determining where organisms live.</li><li>6. Population Ecology Study changes in population numbers over time and the factors increasing or decreasing them.</li></ol>

	<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>
--	--

<p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p>
---

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

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

### Module Evaluation

تقييم المادة الدراسية

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

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

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Ecology, Hussein Saadi.	Yes
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.sciencedirect.com">https://www.sciencedirect.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>Genetics</b>		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	<b>Bio-321</b>			
ECTS Credits				
SWL (hr/sem)	<b>150</b>			
Module Level	3	Semester of Delivery		6
Administering Department	Bio	College	Meddle east	
Module Leader	Alhan Hashim sheat		e-mail	Alhan. <a href="mailto:H.s.@meuc.edu.iq">H.s.@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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
<b>Module Learning Outcomes</b> 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.
<b>Indicative Contents</b> 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

<b>Strategies</b>	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
-------------------	--

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

### Module Evaluation

#### تقييم المادة الدراسية

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction to genetic
<b>Week 2</b>	Mendelian inheritance
<b>Week 3</b>	Law applications Mendel I
<b>Week 4</b>	Law applications

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	General Genetics book written by: Dr. Abdul Hussein Al-Faisal	No
<b>Recommended Texts</b>	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
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 – 49)</b>	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	<b>Histology</b>		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	<b>Bio-313</b>		
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	<a href="mailto:Rasha.M.A.@meuc.edu.iq">Rasha.M.A.@meuc.edu.iq</a>
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><b>Module Objectives</b> 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><b>Module Learning Outcomes</b> 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><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><b>Nervous system [2 hrs]</b></p> <p>a- Neurons, neuroglia.</p> <p>b- Nerve fibers, nerve trunk, and synapses.</p> <p>c- Sympathetic &amp; parasympathetic system.</p> <p>d- Meninges, spinal cord.</p> <p>e- Cerebrum, cerebellum.</p> <p><b>Hematopoiesis system [2 hrs]</b></p> <p>a- Red and yellow bone marrow, maturation &amp; erythrocytes maturation &amp; granulocyte.</p> <p>b- Maturation &amp; lymphocytes &amp; monocytes, origin of platelets</p> <p><b>Circulatory system [2 hrs]</b></p> <p>a- General structure &amp; blood vessels, general structure, types &amp; capillaries.</p> <p>b- General structures &amp; different types &amp; arteries.</p> <p>c- General structure &amp; different types &amp; veins, general structure &amp; heart</p> <p><b>Lymphoid system [2 hrs]</b></p> <p>a- Cellular &amp; humoral immunity, antigen &amp; antibody, differentiation T &amp; B-</p> <p>b- lymphocytes.</p> <p>c- Thymus, lymph node.</p> <p>d- Spleen, tonsil, encapsulated lymphoid.</p> <p><b>Digestive system [2 hrs]</b></p> <p>a- General structure &amp; digestive tract, lip.</p> <p>b- Pharynx, esophagus, cardiac &amp; pyloric parts &amp; stomach.</p> <p>c- Parts &amp; small intestine (duodenum, jejunum &amp; ileum).</p>

	<p>d- Colon, rectum, appendix.</p> <p>e- Salivary gland (parotid gland - sublingual gland &amp; submaxillary gland).</p> <p>f- Liver.</p> <p>g- Pancreas, gall bladder</p> <p><b>Respiratory system [2 hrs]</b></p> <p>a- Nasal cavity, paranasal sinuses, nasopharynx.</p> <p>b- Larynx, trachea, bronchial tree.</p> <p>c- Pulmonary blood vessels, nerves, pleura &amp; lung</p> <p><b>Integumentary system [2 hrs]</b></p> <p>a- Epidermis.</p> <p>b- Dermis, subcutaneous layer.</p> <p>c- Hair, nails.</p> <p>d- Glands &amp; skin, vessels &amp; nerves &amp; the skin</p> <p><b>Urinary system [2 hrs]</b></p> <p>A- Nephron.</p> <p>b- Collecting tubule &amp; ducts, juxtaglomerular apparatus.</p> <p>c- Blood circulation, bladder &amp; ureter.</p> <p><b>Reproductive system [2 hrs]</b></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><b>Endocrine system [2 hrs]</b></p> <p>a- Pituitary gland.</p> <p>b- Adrenal gland.</p> <p>c- Thyroid gland, parathyroid gland, pineal body.</p> <p><b>Sense organs [2 hrs]</b></p> <p>Receptors related to somatic &amp; visceral sensitivity, proprioceptor system, and chemoreceptors.</p> <p>b- The eye.</p> <p>c- The ear</p>
--	--

### Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

<b>Strategies</b>	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 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

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

### Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative</b>	<b>Midterm Exam</b>	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	<b>First month Exam</b>
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	<b>second month exam</b>
Week 16	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	<p style="text-align: center;"><b>Hematopoiesis system</b></p> Human blood smear, RBCS, Platelets & WBCs
Week 2	<p style="text-align: center;"><b>Circulatory system</b></p> Heart, Arteries, Veins, capillaries & Lymphatic vessels
Week 3	<p style="text-align: center;"><b>Lymphoid system</b></p> Palatine tonsil, lymph node, thymus, & spleen
Week 4	<p style="text-align: center;"><b>Digestive system</b></p> Esophagus, Stomach, small & large intestine, liver, gall bladder & pancreas
Week 5	<p style="text-align: center;"><b>Respiratory system</b></p> Larynx, Trachea, & lung
Week 6	<p style="text-align: center;"><b>Integumentary system</b></p> Epidermis, dermis, hair, & sweat gland
Week 7	<p style="text-align: center;"><b>Urinary system</b></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 <sup>rd</sup> 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
<b>Success Group</b> <b>(50 - 100)</b>	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
<b>Fail Group</b> <b>(0 - 49)</b>	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	<b>Immunology</b>		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	<b>Bio-325</b>			
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

### Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

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

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
<b>Week 1</b>	Lab 1: Introduction in practical immunology

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

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

## Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> (0 - 49)	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - 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	<b>Microbial Physiology</b>			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	<b>Bio-326</b>						
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	<a href="mailto:Dania.A.A.@meuc.edu.iq">Dania.A.A.@meuc.edu.iq</a>			
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

<b>Module Objectives</b> 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>
<b>Module Learning Outcomes</b> 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>
<b>Indicative Contents</b> 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

<b>Strategies</b>	<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>
-------------------	--

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

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

### 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

	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	2hr	50% (50)	16	All
<b>Total assessment</b>			100% (100 Marks)		

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Introduction to microbiology physiology
<b>Week 2</b>	Classification of microorganisms (eukaryotes and prokaryotes)
<b>Week 3</b>	Eubacteria and archaea
<b>Week 4</b>	Structure and function of a bacterial cell
<b>Week 5</b>	Nutrition and growth
<b>Week 6</b>	Bacterial growth stages
<b>Week 7</b>	Regulation of metabolism in bacteria
<b>Week 8</b>	<b>Mid-term Exam</b>
<b>Week 9</b>	respiration and fermentation
<b>Week 10</b>	Krebs cycle and glycolysis
<b>Week 11</b>	Oxidative phosphorylation and electron transport
<b>Week 12</b>	Structures and eukaryotic functions
<b>Week 13</b>	Differentiate between the physiology of eukaryotic and prokaryotic microbes
<b>Week 14</b>	Control of microbial growth
<b>Week 15</b>	Types of antibiotics and their effect
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## 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	<a href="https://www.uoanbar.edu.iq/staff-page.php?ID=1336">https://www.uoanbar.edu.iq/staff-page.php?ID=1336</a>	

## Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (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
<b>Fail Group</b> (0 – 49)	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>Microbiology of soil and water</b>		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	<b>Bio-422</b>		
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	<a href="mailto:Dania.A.A@meuc.edu.iq">Dania.A.A@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p><b>Soil Microbiology:</b> It is the branch of science/ microbiology concerned with soil-inhabiting microorganisms, their functions, and activities.</p> <p><b>Soil</b> 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 <b>soil forming factors</b> includes topography of the land, the organisms present in the environment, the climate, the parent material, and the time.</p> <p><b>Soil texture and soil structure</b></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><b>Soil texture</b> 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 in diameter 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 two groups:

- 1- Silicate minerals**

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

- 2- Non – Silicate minerals**

Minerals that are not composed of silicate groups. Make up 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 للطلاب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطلاب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطلاب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطلاب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطلاب خلال الفصل	<b>125</b>		

### Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

	Material Covered
<b>Week 1</b>	Introduction of Soil Microbiology
<b>Week 2</b>	Soil Microorganisms
<b>Week 3</b>	Soil Bacteria
<b>Week 4</b>	Some factors affecting the growth and reproduction of soil bacteria:
<b>Week 5</b>	The carbon cycle and its relationship to soil microbes:
<b>Week 6</b>	pesticides:
<b>Week 7</b>	Exam
<b>Week 8</b>	<i>Nitrogen cycle and its relationship to soil microbes:</i>
<b>Week 9</b>	Aquatic Microbiology
<b>Week 10</b>	Biological factors of the aquatic environment and their impact on microorganisms
<b>Week 11</b>	Drinking water:
<b>Week 12</b>	Exam
<b>Week 13</b>	Biological Wastewater Treatment
<b>Week 14</b>	factors that affect the self-purification of water
<b>Week 15</b>	Preparatory week before the final Exam
<b>Week 16</b>	Preparatory week before the final Exam

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<ol style="list-style-type: none"> <li>1. Wood, Martin. Soil Biology. New York: Chapman and Hall, 1989. Print</li> <li>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></li> </ol>	Yes
<b>Recommended Texts</b>	<ol style="list-style-type: none"> <li>1. Wood, Martin. Soil Biology. New York: Chapman and Hall, 1989. Print</li> <li>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></li> </ol>	Yes
<b>Websites</b>		

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Mycology I</b>		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	<b>Bio-324</b>		
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	<a href="mailto:Alhan.H.S.@meuc.edu.iq">Alhan.H.S.@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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

<b>Strategies</b>	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.
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## Module Evaluation

### تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Introduction to course
<b>Week 2</b>	Introduction taxonomy of fungi
<b>Week 3</b>	Myxomycetes
<b>Week 4</b>	Mastigomycotina
<b>Week 5</b>	Diplomastigomycotina
<b>Week 6</b>	Amastigomycotina
<b>Week 7</b>	Mid-term Exam
<b>Week 8</b>	Zygomycotina
<b>Week 9</b>	Ascomycotina
<b>Week 10</b>	Hemiascomycotina
<b>Week 11</b>	Basidiomycotina
<b>Week 12</b>	Oomycotina
<b>Week 13</b>	Types of disease caused by fungi
<b>Week 14</b>	Dermatophytes
<b>Week 15</b>	Cutaneous mycoses
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	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
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.youtube.com/watch?v= 6oLUAnSoOE">https://www.youtube.com/watch?v= 6oLUAnSoOE</a>	

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (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
<b>Fail Group</b> (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	<b>Mycology I</b>		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	<b>Bio-314</b>		
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	<a href="mailto:Alhan.H.S.@meuc.edu.iq">Alhan.H.S.@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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

<b>Strategies</b>	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.
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative</b>	<b>Quizzes</b>	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	<b>Mid-term Exam</b>
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	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	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
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.youtube.com/watch?v= 6oLUAnSoOE">https://www.youtube.com/watch?v= 6oLUAnSoOE</a>	

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> (50 - 100)	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> (0 – 49)	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Plant Physiology</b>		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	<b>Bio-315</b>		
ECTS Credits	5		
SWL (hr/sem)	<b>125</b>		
Module Level	3	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Osama Qasim Abdulameer	e-mail	<a href="mailto:osama.qasim@meuc.edu.iq">osama.qasim@meuc.edu.iq</a>
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><b>Module Objectives</b> 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><b>Module Learning Outcomes</b> 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><b>Indicative Contents</b> 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.] <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>
--	---

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	--

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

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

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Introduction to course
<b>Week 2</b>	Plant cell structure
<b>Week 3</b>	Plant cell structure
<b>Week 4</b>	Water Relations
<b>Week 5</b>	Mathematical problems for calculating water potential
<b>Week 6</b>	Loss of water from the plant
<b>Week 7</b>	<b>Mid-term Exam</b>
<b>Week 8</b>	Mechanisms of Solute Transport Across Plasma Membranes

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	- أساسيات فسيولوجيا النبات . 2001 . د. بسام طه ياسين كلية العلوم جامعة قطر	Yes
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="#">pdf.pdf</a> المحاليل الكيميائية - مكتبة الفريد الإلكترونية	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Pollution</b>		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	<b>Bio-322</b>		
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	<a href="mailto:Farid.m.mahdi@meuc.edu.iq">Farid.m.mahdi@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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>
--	--

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	--

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## Module Evaluation

تقييم المادة الدراسية

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

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

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

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Environmental pollution, Laurant hogs. Ministry of higher education and scientific research.	Yes
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.sciencedirect.com">https://www.sciencedirect.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 – 49)</b>	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	<b>Principle of Research Methodology</b>		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	<b>Bio-317</b>		
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	<a href="mailto:Jaber.Esmael@meuc.edu.iq">Jaber.Esmael@meuc.edu.iq</a>
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

<p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<p><b>This study aims</b></p> <p>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:</p> <ol style="list-style-type: none"><li><b>1. Understand Scientific Inquiry:</b> Grasp the systematic process of asking questions, investigating phenomena, and refining knowledge through structured methods.</li><li><b>2. Develop Critical Thinking:</b> Cultivate the ability to analyze information, evaluate evidence, and reason logically to draw objective conclusions.</li><li><b>3. Formulate Hypotheses/Questions:</b> Learn to craft testable hypotheses and research questions that guide investigations.</li><li><b>4. Master Methodologies:</b> Gain proficiency in qualitative, quantitative, experimental, and observational research designs.</li><li><b>5. Acquire Data Skills:</b> Learn techniques for collecting, organizing, and analyzing data using appropriate statistical or thematic tools.</li><li><b>6. Uphold Ethics:</b> Adhere to integrity, transparency, and responsibility in research, including informed consent and data privacy.</li><li><b>7. Communicate Findings:</b> Effectively share results through academic writing, presentations, and visualizations for peer and public engagement.</li><li><b>8. Enhance Problem-Solving:</b> Apply structured approaches to address complex issues and propose evidence-based solutions.</li><li><b>9. Expand Knowledge:</b> Contribute new insights to existing literature, driving intellectual and practical advancements.</li><li><b>10. Support Evidence-Based Decisions:</b> Provide reliable data to inform policies, practices, and innovations across fields.</li><li><b>11. Foster Innovation:</b> Stimulate technological and conceptual breakthroughs by exploring uncharted territories.</li><li><b>12. Encourage Collaboration:</b> Promote teamwork and peer review to validate research quality and foster interdisciplinary progress.</li><li><b>13. Nurture Curiosity:</b> Inspire a passion for discovery and openness to exploring novel ideas and challenges.</li></ol>
--	--

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

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

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<b>Implementation Framework</b>
	<ul style="list-style-type: none"> <li>• <b>Phase 1:</b> Foundational knowledge (lectures, tool training).</li> <li>• <b>Phase 2:</b> Application (workshops, micro-projects).</li> <li>• <b>Phase 3:</b> Synthesis (capstone projects, peer reviews).</li> </ul> <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

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

## Module Evaluation

### تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

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

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

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	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
<b>Fail Group</b> <b>(0 - 49)</b>	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	<b>Bacterial toxins</b>		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	<b>Bio-422</b>		
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 <a href="mailto:M.M.@meuc.edu.iq">M.M.@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Bacteria toxins which can be classified as either <a href="#">exotoxins</a> or <a href="#">endotoxins</a>. Exotoxins are generated and actively secreted; endotoxins remain part of the bacteria. Usually, an endotoxin is part of the <a href="#">bacterial outer membrane</a>, and it is not released until the bacterium is killed by the <a href="#">immune system</a>. The body's response to an endotoxin can involve severe <a href="#">inflammation</a>. In general, the inflammation process is usually considered beneficial to the infected host, but if the reaction is severe enough, it can lead to <a href="#">sepsis</a>. 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 <a href="#">tumors</a>. Endotoxins most commonly refer to the <a href="#">lipopolysaccharide</a> (LPS) or <a href="#">lipooligosaccharide</a> (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 <a href="#">enterotoxin</a>, <a href="#">neurotoxin</a>, <a href="#">leukocidin</a> or <a href="#">hemolysin</a> 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.<sup>1</sup> 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  $\gamma$ -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](#).<sup>[7]</sup> These toxin examples are classified as [superantigens](#).<sup>[7]</sup>

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*.<sup>[8]</sup> Stxs act through inhibiting protein synthesis of infected cells and can be divided into two antigenically different groups: Stx/Stx1 and Stx2.<sup>[7]</sup> 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.<sup>[8]</sup> 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](#).<sup>[7]</sup> 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.<sup>[10]</sup> 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.<sup>[10]</sup> [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.<sup>[7]</sup> 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.<sup>[11]</sup> Diphtheria toxin is an ADP-ribosyltransferase that inhibits protein synthesis which causes the symptoms associated with the disease.<sup>[7]</sup> [Diphtheria](#) used to be a leading cause of childhood death until the creation of a vaccine.<sup>[11]</sup> 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](#).<sup>[13]</sup> *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

<b>Strategies</b>	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.
-------------------	---

<b>Student Workload (SWL)</b>			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b>				
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	<b>Exam</b>
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	<b>Exam</b>
Week 13	Pore-forming toxins1
Week 14	Pore-forming toxins2
Week 15	Endotoxins

<b>Week 16</b>	Preparatory week before the final Exam
----------------	--

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	علم السموم البكتريا , الاستاذ الدكتور رحاب العزاوي 2010 - السموم الميكروبية رشا حمد الميهي وجمهورية مصر العربية 2014	Yes
<b>Recommended Texts</b>	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	
<b>Websites</b>		

### Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>Biotechnology and Genetic Engineering</b>		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	<b>Bio-414</b>		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farqad Abdraheem AbdIftaah	e-mail	Farqad <a href="mailto:A.A@meuc.edu.iq">.A.A@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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.
<b>Module Learning Outcomes</b> 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
<b>Indicative Contents</b> 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>
--	--

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	--

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	21	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

**Module Evaluation**

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	6	12% (5)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	6	12% (5)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	8% (20)	Continuous	All
	<b>Report</b>	4	8% (5)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	1hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			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	<b>Mid-term Exam</b>
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	<b>Preparatory week before the final Exam</b>
Week 16	<b>final Exam</b>

## 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.

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

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 - 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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 href="mailto:A.A@meuc.edu.iq">.A.A@meuc.edu.iq</a>
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><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<p>60. This class discusses the fundamental aspects of <b>Genetic Microbiology</b>.</p> <p>61. its importance to mankind in a brief and articulate explanation of this newly originated science.</p> <p>62. Highlights the general morphology, genetic structure, function of Genetic Microbiology</p> <p>63. Underlie the principles and application of Recombinant phage DNA technology in pharmaceutical, and biomedical fields.</p>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>87. Discuss reasons for studying Genetic Microbiology</p> <p>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.</p> <p>89. Explain the role of primers in gene nucleic acid synthesis; the roles of host proteins in Genetic Microbiology genome replication</p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p><b>Microbial Genetics Genetics is the study of heredity which is concerned with how</b></p> <p>information in nucleic acids is expressed nucleic acids are duplicated and transmitted to progeny these processes account for the characteristics of progeny</p> <p><b>2. DNA Replication in Bacteria</b></p> <p>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><b>Steps of DNA Replication</b></p> <p>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><b>RNA Synthesis in Bacteria</b></p> <p>Transcription is the synthesis of RNA and involves the assembly of nucleotides by an enzyme, RNA polymerase.</p> <ol style="list-style-type: none"> <li>1. RNA polymerase binds to DNA at a promoter site near the gene to be transcribed.</li> <li>2. RNA polymerase travels the length of the DNA using it as a template to duplicate.</li> <li>3. The RNA polymerase continues until it reaches a termination site at which time the transcription is complete.</li> </ol>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## 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	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	<b>How do scientists use plasmids</b>
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	<b>Gene Transfer</b>

<b>Week 16</b>	<b>Preparatory week before the final Exam</b>
----------------	---

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	<b>Fundamental Molecular Biology</b> . Lizabeth A. Allison 2007	No
<b>Recommended Texts</b>	<b>Molecular Genetics of Bacteria</b> Jeremy W. Dale <b>Simon F. Park</b> University of Surrey, UK	No
<b>Websites</b>	www.blackwellpublishing.com <a href="http://www.wiley.com">www.wiley.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Mycology I</b>		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	<b>Bio-424</b>		
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	<a href="mailto:Alhan.H.S.@meuc.edu.iq">Alhan.H.S.@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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

<b>Strategies</b>	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.
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

<b>Required Texts</b>	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
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.youtube.com/watch?v=_6oLUAnSo0E">https://www.youtube.com/watch?v=_6oLUAnSo0E</a> <a href="https://www.youtube.com/watch?v=6kT7vLbuX9U">https://www.youtube.com/watch?v=6kT7vLbuX9U</a>	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A – Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D – Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E – Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>Mycology I</b>		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	<b>Bio-414</b>		
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	<a href="mailto:Alhan.H.S.@meuc.edu.iq">Alhan.H.S.@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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

<b>Strategies</b>	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.
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	79	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

	2017. Plant Pathology Concepts and Laboratory Exercises .3ed . edt . CRC Press Taylor & Francis Group . Boca Raton London New York.	
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.youtube.com/watch?v= 6oLUAnSoOE">https://www.youtube.com/watch?v= 6oLUAnSoOE</a> <a href="https://www.youtube.com/watch?v=6kT7vLbuX9U">https://www.youtube.com/watch?v=6kT7vLbuX9U</a>	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Virology</b>		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	<b>Bio-422</b>		
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 href="mailto:A.A@meuc.edu.iq">.A.A@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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

<b>Strategies</b>	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.
-------------------	--

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

#### المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 – 49)</b>	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 <a href="mailto:M.M.@meuc.edu.iq">M.M.@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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>
--	---

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

## Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			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
<b>Week 1</b>	Lab 1: General instructions within the Industrial microorganisms laboratory
<b>Week 2</b>	Lab 2: Isolation of industrial microorganisms and methods of preserving isolates
<b>Week 3</b>	Lab 3: methods of preserving isolates
<b>Week 4</b>	Lab 4: Isolation of antibiotic-producing from bacteria
<b>Week 5</b>	Lab 5: Microbial production of antibiotics
<b>Week 6</b>	Lab 6: Isolation of amylase-producing microorganisms
<b>Week 7</b>	Lab 7: Isolation of protease-producing microorganisms
<b>Week 8</b>	Lab 8: Production of citric acid from microorganisms
<b>Week 9</b>	Lab9: Some applications of lactic fermentation
<b>Week 10</b>	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?
<b>Required Texts</b>	Industrial Microbiology: Principles and Applications" Michael J. Waites: Wiley)	Yes
<b>Recommended Texts</b>	Copyright © 2000-2023 by John Wiley & Sons, Inc. or related companies. All rights reserved.	No
<b>Websites</b>	<a href="https://4lfonsina.files.wordpress.com/2012/11/industrial-microbiology-an-introduction-0632053070-wiley.pdf">https://4lfonsina.files.wordpress.com/2012/11/industrial-microbiology-an-introduction-0632053070-wiley.pdf</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<a href="mailto:Raneem.mohammed@meuc.edu.iq">Raneem.mohammed@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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>
<b>Module Learning Outcomes</b> 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>
<b>Indicative Contents</b> 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><b>Definition of Food Microorganisms:</b></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><b>The Effect of Microorganisms on Food:</b></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><b>Microorganisms and the Digestive System:</b></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><b>Microorganisms and Food Preservation:</b></p> <p>Examining the use of microorganisms in various technologies.</p>

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	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.
-------------------	--

## Student Workload (SWL)

### الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative assessment</b>	<b>Quizzes</b>	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	<b>Assignments</b>	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	<b>Projects / Lab.</b>	1	10% (10)	Continuous	All
	<b>Report</b>	1	10% (10)	13	LO #5, #8 and #10
<b>Summative assessment</b>	<b>Midterm Exam</b>	2hr	10% (10)	7	LO #1 - #7
	<b>Final Exam</b>	3hr	50% (50)	16	All
<b>Total assessment</b>			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?
<b>Required Texts</b>	Food Microbiology: Fundamentals and Frontiers" بواسطة Michael P. Doyle وRobert L. Buchanan.	Yes
<b>Recommended Texts</b>	Copyright © 2000-2023 by John Wiley & Sons, Inc. or related companies. All rights reserved.	No
<b>Websites</b>	<a href="https://www.wiley.com/en-us/Food+Microbiology%3A+Fundamentals+and+Frontiers%2C+5th+Edition-p-9781555816261">https://www.wiley.com/en-us/Food+Microbiology%3A+Fundamentals+and+Frontiers%2C+5th+Edition-p-9781555816261</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> - Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> - 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	<b>Chordates</b>		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	<b>Bio-426</b>		
ECTS Credits	4		
SWL (hr/sem)	<b>100</b>		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Raneem Mohammed AbdlJaleel	e-mail	Raneem <a href="mailto:Mohammed@meuc.edu.iq">Mohammed@meuc.edu.iq</a>
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

<b>Module Objectives</b> أهداف المادة الدراسية	<ul style="list-style-type: none"><li>• Identifying and classifying different animal groups</li><li>• Anatomical comparison of different body organs and systems</li><li>• Comparing animals to each other to observe differences in the complexity of their bodies</li></ul>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>A. Knowledge and Understanding:</p> <ol style="list-style-type: none"><li>1. The student will be able to identify organisms belonging to the phylum Chordata.</li><li>2. The student will be able to classify these organisms.</li><li>3. The student will be able to compare them structurally and behaviorally.</li><li>4. The student will be able to dissect laboratory animals.</li><li>5. The student will be able to create skeletons of some animals and preserve others.</li></ol> <p>B. Subject-Specific Skills:</p> <ol style="list-style-type: none"><li>1. The student will understand the basis for classifying these organisms.</li><li>2. The student will be able to explain these differences and relate them to environmental variables.</li><li>3. The student will be able to connect ancestors and current generations evolutionarily.</li><li>4. The student will be able to envision the future of these organisms.</li><li>5. The student will understand and explain the role of materials used in preservation.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Teaching and Learning Methods:</p> <ol style="list-style-type: none"><li>A. Theoretical Lectures</li><li>B. Practical Laboratories</li><li>C. Films and Slides</li><li>D. Field Trips for Application</li></ol> <p>Assessment Methods:</p> <ol style="list-style-type: none"><li>1. Daily and Monthly Exams</li><li>2. Practical Tests</li><li>3. Oral Exams</li><li>4. Attendance</li></ol> <p>C. Thinking Skills -</p> <ol style="list-style-type: none"><li>1. Ability to identify these organisms</li><li>2. Raising laboratory animals</li><li>3. Dissecting animals</li></ol>

	<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>
--	--

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	--

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>
---	------------

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Characteristics of the Phylum Chordata
<b>Week 2</b>	Classification of the Chordata
<b>Week 3</b>	Class Fish
<b>Week 4</b>	Class Amphibians and Reptiles
<b>Week 5</b>	Class Aves
<b>Week 6</b>	Class Mammals

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Characteristics of the Phylum Chordata
<b>Week 2</b>	Classification of the Chordata
<b>Week 3</b>	Class Fish
<b>Week 4</b>	Class Amphibians and Reptiles
<b>Week 5</b>	Class Aves
<b>Week 6</b>	Class Mammals
<b>Week 7</b>	Comparative Study of types of Chordata
<b>Week 8</b>	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	<b>Enzymology</b>		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	<b>Bio-413</b>		
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	<a href="mailto:Farqad.A.A@meuc.edu.iq">Farqad.A.A@meuc.edu.iq</a>
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><b>Module Objectives</b></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"> <li>1. Classification of enzymes</li> <li>2. Characteristic of enzymes</li> <li>3. Structure of enzymes</li> </ol>
<p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> <li>1. Comprehension enzyme properties.</li> <li>2. Conception the enzymatic chemical reaction.</li> <li>3. Perception the application of enzymes.</li> <li>4. The Students learn how to prepare chemical solutions</li> <li>5. The students Learn how to prepare bacterial extract</li> <li>6. The students Learn how to detect different types of enzymes</li> </ol> <p><b>Indicative Contents</b></p>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Part A – Theoretical lectures</p> <p><b>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]</b></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

<b>Strategies</b>	<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>
-------------------	---

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## 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.

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	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
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.slideshare.net/tonyscaria/enzymology-biochemistry-revision-notes">https://www.slideshare.net/tonyscaria/enzymology-biochemistry-revision-notes</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 – 49)</b>	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	<b>pathogenic bacteria</b>		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	<b>Bio-415</b>			
ECTS Credits	5			
SWL (hr/sem)	<b>125</b>			
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></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><b>Indicative Contents</b></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

<b>Strategies</b>	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
-------------------	--

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## Module Evaluation

### تقييم المادة الدراسية

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

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

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

	<b>Material Covered</b>
<b>Week 1</b>	Comprehensive Introduction to Pathogenic Bacteriology
<b>Week 2</b>	Staphylococcus and its genera
<b>Week 3</b>	Streptococcus and its genera
<b>Week 4</b>	Enterobacteriaceae
<b>Week 5</b>	E. coli, Proteus, Klebsiella
<b>Week 6</b>	Enterobacteriaceae
<b>Week 7</b>	Salmonella, Shigella, Yersinia
<b>Week 8</b>	Mid exam
<b>Week 9</b>	Brucella, Haemophilus, Bordetella
<b>Week 10</b>	Neisseria and its genera
<b>Week 11</b>	Aerobic spore-forming bacteria
<b>Week 12</b>	Bacillus, Clostridium
<b>Week 13</b>	Pseudomonas and its genera
<b>Week 14</b>	Spirochaetes
<b>Week 15</b>	Bacteroides
<b>Week 16</b>	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 <sup>th</sup> edition.	No
Websites	www.blackwellpublishing.com <a href="http://www.wiley.com">www.wiley.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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	<b>Pathological analyses</b>		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	<b>Bio-416</b>		
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	<a href="mailto:Aeshah.m.m@meuc.edu.iq">Aeshah.m.m@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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.
<b>Module Learning Outcomes</b> 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
<b>Indicative Contents</b> 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

<b>Strategies</b>	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

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>125</b>		

## Module Evaluation

### تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative</b>	<b>Quizzes</b>	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

<b>Week 13</b>	Serological Analyses
<b>Week 14</b>	Histopathology
<b>Week 15</b>	Preparation of Histological Samples
<b>Week 16</b>	<b>Fainal exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

<b>Week 14</b>	Histopathology
<b>Week 15</b>	Preparation of Histological Samples

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	Plenty of Room for Biology at the Bottom ' an introduction to Bionanotechnology" Ehud Gazit, 2007 Internet Sources	No
<b>Recommended Texts</b>	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
<b>Websites</b>	<a href="https://www.slideshare.net/tonyscaria/enzymology-biochemistry-revision-notes">https://www.slideshare.net/tonyscaria/enzymology-biochemistry-revision-notes</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	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	<a href="mailto:Saleh.A.Abdallah@meuc.edu.iq">Saleh A. Abdallah@meuc.edu.iq</a>
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<ul style="list-style-type: none"> <li>• Understand the topic of biodiversity and its importance in different environments.</li> <li>• Understand the factors affecting biodiversity that can reduce natural resources.</li> <li>• Understand the food chain and food web and their relationship to biodiversity</li> <li>• Understand the vital indicators for measuring biodiversity</li> <li>• Understand the processes of ecological succession in its various types</li> <li>• Understand the areas of vital importance that are considered environmental hot spots</li> <li>• Understand sustainable development and its importance in preserving biodiversity</li> <li>• Use sustainable development in developing products and reducing the environmental impact of industrial products</li> </ul>
<p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<ul style="list-style-type: none"> <li>• Introduction to biodiversity and its importance in different environments.</li> <li>• Factors affecting biodiversity that can reduce natural resources.</li> <li>• Food chain and food web and their relationship to biodiversity</li> <li>• Bioindicators for measuring biodiversity</li> <li>• Ecological succession and its different types</li> <li>• Hot spots and the importance of preserving them</li> </ul>

- 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

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

## 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?
<b>Required Texts</b>	BIODIVERSITY CONSERVATION A Very Short Introduction David W. Macdonald	No
<b>Recommended Texts</b>	Microbial Biodiversity, Biotechnology and Ecosystem Sustainability Cristóbal Noé Aguilar, Sabu Abdulhameed, Raul Rodriguez-Herrera and Shiburaj Sugathan	No
<b>Websites</b>	<a href="https://education.nationalgeographic.org/resource/biodiversity/">https://education.nationalgeographic.org/resource/biodiversity/</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	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
<b>Fail Group (0 - 49)</b>	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	<b>Endocrinology</b>		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	<b>Bio-425</b>			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	4	Semester of Delivery		8
Administering Department	Bio	College	Meddle east	
Module Leader	Farqad AbdIraheem AbdIftaah		e-mail	Farqad <a href="mailto:A.A@meuc.edu.iq">.A.A@meuc.edu.iq</a>
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><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>	<p>The module objectives of an endocrinology module may include:</p> <ol style="list-style-type: none"><li>1. Understanding the principles of endocrinology, including hormone synthesis, secretion, and regulation.</li><li>2. Describing the structure and function of different endocrine glands, including the pituitary, thyroid, parathyroid, adrenal, pancreas, and gonads.</li><li>3. Understanding the role of hormones in maintaining homeostasis, including the regulation of metabolism, growth, and development.</li><li>4. Analyzing the pathophysiology of endocrine disorders, including diabetes, thyroid disorders, adrenal disorders, and reproductive disorders.</li><li>5. Understanding the principles of endocrine diagnostic testing, including laboratory assessments and imaging techniques.</li><li>6. Describing the use of pharmacological agents in the treatment of endocrine disorders.</li><li>7. Understanding the principles of endocrine research, including molecular and genetic approaches to studying hormone function and regulation.</li></ol> <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><b>Module Learning Outcomes</b></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"><li>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.</li><li>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.</li><li>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.</li><li>4. Communication: Students should be able to communicate effectively and clearly about endocrinology concepts, both orally and in writing, using appropriate</li></ol>

	<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><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>	<p>The indicative contents of an endocrinology module may include:</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>

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

<b>Strategies</b>	<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"> <li><b>1. Lectures:</b> 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.</li> <li><b>2. Case based learning:</b> 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.</li> <li><b>3. Small group discussions:</b> 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.</li> <li><b>4. Laboratory sessions:</b> Laboratory sessions can provide students with hands on experience in endocrine diagnostic testing, including laboratory assessments and imaging techniques.</li> </ol>
-------------------	--

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

## 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

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A – Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D – Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E – Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>English Language</b>		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	<b>Bio-417</b>		
ECTS Credits	2		
SWL (hr/sem)	<b>50</b>		
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><b>Module Objectives</b></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><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>A. Cognitive Objectives</p> <ol style="list-style-type: none"><li>1. To be able to understand the material and use blended learning.</li><li>2. To know and understand the course topics.</li><li>3. To possess clarity in the cognitive aspect to reach a high level of sound scientific awareness.</li><li>4. To acquire practical skills that qualify the student to perform the applied aspects of life sciences.</li></ol> <p>B. Course-Specific Skills Objectives</p> <ol style="list-style-type: none"><li>1. To acquire the self-directed skills at the level of the required method.</li><li>2. To acquire the required cognitive and intellectual skills.</li><li>3. To acquire the required practical skills.</li><li>4. To participate in discussions and dialogues using English vocabulary in the classroom.</li></ol>
<p><b>Indicative Contents</b></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"><li>A. Daily quizzes, oral exams, monthly exams, and term reports for theoretical material.</li><li>B. Distribution of grades: For English language (20% for the first semester), (20% for the second semester) / 60% for the final exam.</li><li>C. Allocating additional marks for classroom and extracurricular activities</li></ol> <p>C. Affective and Value-Based Objectives</p> <ol style="list-style-type: none"><li>C1. Developing the student's awareness of the importance of the English language in daily and academic life</li></ol>

	<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>
--	--

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<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>
-------------------	--

### Student Workload (SWL)

#### الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
<b>Total SWL (h/sem)</b>	<b>50</b>		
الحمل الدراسي الكلي للطالب خلال الفصل			

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

<b>Delivery Plan (Weekly Syllabus)</b>	
المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	Unit 1 Home and away
<b>Week 2</b>	Unit 2 Been there, done that !
<b>Week 3</b>	Discussion
<b>Week 4</b>	Unit 3 What a story

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

### Learning and Teaching Resources

مصادر التعلم والتدريس

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

## Grading Scheme

### مخطط الدرجات

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

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Antibiotics</b>		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	<b>Bio-425</b>		
ECTS Credits	4		
SWL (hr/sem)	<b>100</b>		
Module Level	4	Semester of Delivery	
Administering Department	Bio	College	Meddle east
Module Leader	Farqad AbdIraheem AbdIftaah	e-mail	Farqad <a href="mailto:A.A@meuc.edu.iq">.A.A@meuc.edu.iq</a>
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

<b>Module Objectives</b> 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>
<b>Module Learning Outcomes</b> 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>
<b>Indicative Contents</b> 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

<b>Strategies</b>	<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 Antibiotic classes designed to introduce you to it. At the same time refining and expanding their</p>
-------------------	--

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

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	63	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	7
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>100</b>		

### Module Evaluation

تقييم المادة الدراسية

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

<b>Total assessment</b>	100% (100 Marks)		
-------------------------	------------------	--	--

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

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

### 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  <a href="http://www.wiley.com">www.wiley.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group</b> <b>(50 - 100)</b>	<b>A – Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C – Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D – Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E – Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group</b> <b>(0 – 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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	<b>Molecular Biology</b>		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	<b>Bio-411</b>		
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 href="mailto:A.A@meuc.edu.iq">.A.A@meuc.edu.iq</a>
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><b>Module Objectives</b> 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><b>Module Learning Outcomes</b> 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><b>Indicative Contents</b> المحتويات الإرشادية</p>	<p><b>Molecular biology</b> 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><b>DNA as a Genetic Material rather than Proteins: Classic Experiments</b></p> <p><b>I. Frederick Griffith: Bacterial Transformation</b> 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><b>2. Avery, McCarty, and MacLeod: Identifying the transforming principle</b> 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><b>Hershey-Chase experiments</b> In their experiments, Hershey and Chase studied <b>bacteriophages</b>, 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

<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>
---	------------

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	<b>Material Covered</b>
<b>Week 1</b>	Introduction to course
<b>Week 2</b>	DNA as a Genetic Material rather than Proteins: Classic Experiments
<b>Week 3</b>	The Molecular Composition of DNA
<b>Week 4</b>	DNA Molecular Structure
<b>Week 5</b>	DNA replication
<b>Week 6</b>	DNA Replication in Prokaryotes

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

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
<b>Required Texts</b>	<b>Fundamental Molecular Biology</b> . Lizabeth A. Allison 2007	No
<b>Recommended Texts</b>	<b>Molecular Genetics of Bacteria</b> Jeremy W. Dale <b>Simon F. Park</b> University of Surrey, UK	No
<b>Websites</b>	www.blackwellpublishing.com <a href="http://www.wiley.com">www.wiley.com</a>	

## Grading Scheme

### مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> – Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> – Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> – Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 – 49)</b>	<b>FX</b> – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F</b> – 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.

