

MODULE DESCRIPTION FORM

نموذج وصف مادة اللغة العربية

Module Information			
معلومات المادة الدراسية			
Module Title	اللغة العربية		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	KUS12010		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	2
Administering Department	MBIO	College	SCI
Module Leader	Dr. Ahmed kahlaf		e-mail
Module Leader's Acad. Title		lecturer	Module Leader's Qualification
Module Tutor		Name (if available)	E-mail
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- تعلم العربية السليمة كونها اللغة الرسمية للوطن 2- اللغة جوهر الهوية ورمزها 3- اللغة تختلف عن اللهجة، فالأولى عالمية والثانية محلية 4- توظيف المفردات الفصيحة في الصياغة الأكاديمية للبحوث العلمية مترجمة بنظيرها الفصح 5- التمكن من كتابة البحوث والمقالات ذات المحتوى العلمي الصرف باللغة العربية الفصحى 6- تجنب الأخطاء الشائعة في الكتابة واختيار المفردات الصائبة 7- إثراء الخزين المعجمي لدى الطالب للمساعدة في بناء كاريما التواصل الكلامي 8- الاطلاع على نماذج من الأدب العربي شعرا ونثرا لما لها من أساس في بناء الجانب الثقافي المتنوع لدى الطالب 9- كتابة الأعداد بتمكن فضلا الكتابة الصحيحة في صياغة الطلبات الرسمية 10- التعرف على الدرس الصوتي في اللغة العربية وعلاقته بعلم الفيزياء
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	عند انتهاء مفردات المادة الدراسية يكون الطالب متمكنا من: 1- الكتابة السليمة خالية من الأخطاء 2- التعبير العلمي الأكاديمي الصحيح 3- استعمال المفردات الفصيحة توظيفا ونطقا 4- إضافة رصيد لغوي ومفاهيم جديدة لمعاني الكلمات 5- القدرة على مخاطبة الإدارية في الطلبات الرسمية
Indicative Contents المحتويات الإرشادية	1- لكل تخصص لغته التي تسمى اليه، وتدلل عليه، ولغة كل علم تتبع من طبيعة كنهه، فالاختصاصات العلمية لها معجم خاص بها يعبر عن جوهرها ومضمونها، فضلا عن المصطلحات الخاصة بها التي تدل عليها، وكذلك المصادر العلمية التي يرجع إليها، والحال كما في اللغة الأدبية؛ فهي أيضا لها مفرداتها وطريقة كتابتها والتعبير بها وعبرها، ومصطلحاتها الخاصة بها التي تعبر عنها وتدلل عليها. [2 hrs] 2- المعاجم - بشكل عام - على اختلاف موارها تمثل محتوى وكفا لمفردات أي لغة مقترنة بالشرح والتفسير لتلك المفردات، أما المعاجم في اللغة العربية فهي واسعة ومتنوعة؛ فهناك معاجم غير معجمات اللغة، فالعربية فيها أول معجم جغرافي في التاريخ، معجم البلدان لـ (ياقوت الحموي)، فضلا عن المعاجم المتخصصة في جزئية معينة، مثل معجم البلاغة، فضلا عن تنوع المدارس في تأليف المعاجم وتبويبها وطريقة البحث عن المفردة فيها. [2 hrs] 3- العلامة تدرج ضمن حقل علم السيمياء أو السيميائية، وعلامات الترقيم من المواضيع المهمة بالأخص في البحوث الأكاديمية، بغض النظر عن التخصص، سواء كان التخصص علميا، أو إنسانيا، من هنا تأتي أهمية علامات الترقيم؛ فلها دور سيميائي، ودلالي مهم في الكتابة النصية وفي بناء النص، فهي تُسهّل الفهم على القارئ، وتوضح المعنى المقصود، عبر القراءة والتلفظ بالعبارة، فعلايات الترقيم خير وسيلة لإظهار الصراحة وبيان الوضوح في الكلام المكتوب؛ لأنه يدل الناظر إلى تلك العلامات الاصطلاحية وعلى العلاقات التي تربط أجزاء الكلام ببعضها ببعض بوجه عام، وأجزاء كل جملة بوجه خاص، وكما يقول المتخصصون عن علامات الترقيم: بأن الوقف ليس مستقلاً، وإنما هو من توابع التفكير، أي: إن السكتات المقررة بمقادير مضبوطة في مواضع معينة، ليست مجرد محطات تنفسية بالمعنى البيولوجي للتنفس، وإنما في المقام الأول وقفات معنوية. فالعبرة من الناحية اللغوية ليست بأن يستعيد القارئ نفسه، بل المهم أن يتعاطى القارئ السكت بمقادير معلومة، وفي مواضع محددة من السلسلة المنطوقة رفعا للبس، وصونا لمقصد المتكلم عن التبذل، فهذه العلامات تجسيد لمشاعر الكاتب وقصدياته فيها. [4 hrs]

Indicative Contents المحتويات الإرشادية	4- الأسلوب الكتابي يمثل بصمة للكاتب الذي يصدر عنه، ويتجسد عند القارئ، ولكل كاتب أسلوبه الخاص به، ينعكس ذلك في نتاج الكاتب، وللأسلوب أنواع مختلفة، فهناك الأسلوب العلمي، والأسلوب الأدبي، والأسلوب الخطابي، ولكل نوع خصائصه، وقالبه الذي يتكون فيه. [2 hrs]
	5- الأحداث التي تقترب بالزمن تمثل الأفعال، والأفعال في العربية تناظر الأزمنة في اللغات الأخرى من جانب معين، أو من جزئية معينة، والعربية تحتوي على عدد كبير من الجذور، جذور الأفعال، ففي العربية أفعال ثلاثية ورباعية وخماسية وسداسية، والفعل جزء مهم من أجزاء الكلام الأساسية، فضلا عن الجانب الصوتي في هذه الجذور، فعلم (الأصوات الفيزيائي) من العلوم المهمة في اللغة العربية، إذ يُعد علم (الأصوات الأكوستيكي) علما أقرب إلى الفيزياء منه للعلوم الإنسانية، وهو يمثل المرحلة الوسطى بين علم الأصوات النطقي وعلم الأصوات السمعي، وعلاقته مع اللغة العربية انطلاقا من البذرة الأولى في دراسة مخارج الحروف فيزيائيا ودلاليا. [2 hrs]
	6- الكلام عن الشعر لا ينتهي؛ فالشعر تجسيد لمشاعر الفرد المتمثل بالشاعر، والمشاعر الجمعية للإنسانية جمعاء، فهو موجود لدى كل بني البشر، والشعر العربي القديم كان بمثابة نشيدا وطنيا لهم، يمثل هويتهم الثقافية الرصينة ويمثل سجلا لتاريخهم وأماجدهم، على اختلاف أغراضه من غزل ومدح ورثاء وغير ذلك، وبحور الشعر في الشعر العربي مبنية بناء صوتيا فريدا عبر التفعيلات التي وضعها الخليل بن أحمد الفراهيدي ووضع فلسفتها وكنهها وقواعدها، والشعر رصيد ثقافي، وحجة في الكلام، وزينة ورونقا يضاف على شخصية الفرد والمجتمع بشكل عام. [2 hrs]
	7- الهمزة من المواضيع الاجرائية لدى الفرد الكاتب، بغض النظر عن التخصص، فيحتاجها كل فرد ناطق كاتب بها، فلها قواعدها التي تصدر عنها، وتُكتب بالشكل السليم منها، فموضوع رسم الهمزة من الأهمية بمكان؛ فرسمها يغير من المعنى، فلا بد من وضعها ورسمها بالشكل الصحيح لتوخي التعبير الدقيق عن المعنى المقصود. [2 hrs]
	8- المفاعيل في اللغة العربية، من الموضوعات المهمة في درس اللغة العربية، ولا بد لكل دارس من معرفتها بشكل عام، وهناك آراء مختلفة بين البلاغيين والنحويين عن المفاعيل، هل ان تلك المفعولات فضلة، أم أنها ركن رئيس في الجملة؛ فالنحويون يرون انها فضلة في الجملة، وأن ركني الجملة الأساسيين هما: الفعل، والفاعل، وأما البلاغيون فيرون: إنها ليست فضلة، وإنما هي ركن أساسي في الجملة؛ لأن كل كلمة تُدَلَّ على معنى في الجملة، وإذا ما دلت على معنى فلا تُعد فضلة، وإنما هي ركن رئيس في الجملة وبنائها، ورأي البلاغيين أقرب للصواب من رأي النحويين، فدراستها في العربية لغبر المختصين مما يضيف لهم خزينا تعبيريا متنوعا. [2 hrs] 9- من المعروف وجود ظاهرة الأخطاء اللغوية نحوية كانت أو املائية أو اسلوبية، عند متحدثي اللغة العربية وبالأخص عند غير المختصين بها ولا سيما من يعملون في مجال الاعلام، وهذه الظاهرة اتسعت وزاد انتشارها في العصر الحديث، فأخذت هذه الأخطاء تغزو مجالات الدراسة جميعها، من ذلك موضوع (العدد) في اللغة العربية، فنجد كثيراً من الطلبة وكذلك من عامة الناس يستعملون الأرقام بدلاً من كتابتها بالحروف؛ وذلك لتجنب الوقوع في الخطأ وهذا دليل ضعف لا يليق بالدارس أياً كان تخصصه؛ ولهذا فموضوع العدد وقواعد كتابته في اللغة العربية موضوع لا غنى عنه في زمن لغة الأرقام. [1 hrs] 10- هناك مجموعة من الألفاظ متداولة بشكل كبير، تُستعمل في غير مكانها الصحيح، وفي غير ما وُضعت له وهذه الألفاظ تُستعمل في المخاطبات الرسمية الإدارية بالمعنى غير الصحيح أو الدقيق الذي تحمله تلك الألفاظ من معاني، فضلا عن أهمية توخي الدقة في هذه الألفاظ توظيفا لها في الطلبات الرسمية التي تُقدم على اختلاف موضوعاتها، فالطلب لا بد من ان يكون مختصرا مركزا، يعطي الفكرة الموجزة، والهدف المقصود منه ازاء صاحب الادارة الذي تُقدم اليه الطلبات، وما في ذلك من ايجابيات العمل في التخفيف واختصار للجهد والوقت في تنفيذ المهام الادارية الموكله الافراد على اختلاف درجاتهم. [1 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	صناعة شخصية متكاملة للطالب الجامعي من حيث التخصص العلمي الدقيق والتخصص المساند
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	الفرق بين اللغة العلمية واللغة الأدبية
Week 2	المعاجم العربية وأنواعها
Week 3	علامات الترقيم
Week 4	الأسلوب
Week 5	الأفعال – أنواعها وتقسيماتها
Week 6	نماذج مختارة من الشعر العربي القديم - الشعر الإسلامي - الشعر الأموي
Week 7	Mid-term Exam
Week 8	رسم الهمزة / همزة الوصل وهمزة القطع

Week 9	كتابة الهمزة بداية الكلام وآخره
Week 10	المبتدأ والخبر – مهارات كتابة العدد
Week 11	المفاعيل / المفعول به – المفعول لأجله
Week 12	المفعول معه – المفعول فيه – المفعول المطلق
Week 13	النثر العربي
Week 14	الأخطاء الشائعة – طريقة كتابة الطلبات الرسمية
Week 15	نماذج مختارة من الشعر العباسي والشعر الحديث
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Texts	Available in the Library?
Required Texts	كتاب: العربية الجامعية لغير المتخصصين / د. عبده الراجحي كتاب: النحو التطبيقي / د. عبده الراجحي	كلا
Recommended Texts	الصرف التطبيقي / د. عبده الراجحي النحو الوافي / عباس حسن تاريخ الادب العربي / شوقي ضيف	كلا
Websites	شبكة الفصحى لعلوم اللغة العربية	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	English Language		Module Delivery	
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	KUS12011			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery		2
Administering Department	MBIO	College	SCI	
Module Leader	Taif Hussain Hassan		e-mail	Taif.h.salman91@kus.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Dr. Saad Hussein		e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	3/09/2023	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	a. 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.s
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enhance the efficiency of student to use many reference or books which reported in English language. 2. To develop the competence that students need to read a wide range of general and academic texts in English. 3. To develop students competence in reference skills [locating and evaluating information needed for assignments in a library. 4. demonstrate adequate general and detailed comprehension of a range of advanced general and academic texts 5. undertake research in an academic library
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Attention will be given to both grammatical form and communicative function. Controlled practice will be given to consolidate form and meaning. Classroom activities will be designed to maximize active participation and use of the target language. The Language Labs will be used for students to work on their own individual needs and problems. (4 hrs.) Students' language skills will improve through completion of a range of tasks, both individual and group-based (3 hrs.). In this programme module the Teacher / Tutor will ensure that the Learner uses correct pronunciation and grammatical constructions , to include: □ sentence connectors, for example, and, or, with, but, then □ question words, for example, why, where, who, when when communicating in the English language.(4 hrs.) An ability to read a minimum of 10 introductory level reading texts, on both social information and work-related information. In reading the texts, the Learner will complete tasks to demonstrate an understanding of the context and content of the text □ An ability to read the message being communicated in a minimum of 6 common

	notices and signs ☐ The capacity to complete a simple form requiring personal details such as name, address, phone number, age, date of birth The collection of work may include work sheets, cloze tests, multiple choice statements or other appropriate evidence in the form of written, oral, graphic, audio, visual or any combination of these. Any audio or video evidence must be provided on tape.(5 hrs.) Make different activity for the student to be able to use huge amount of sources such report, books, journals to enhance the abilities and skills.(2 hrs.) Revision problem classes [1 hrs.] <u>Part B -</u> Develop the talking and speaking skills(1 hr.)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Use will be made of individual, pair and groupwork to develop students abilities to read increasingly complex academic and general texts. Other skills will be practised and developed within this modules and students will be expected to work extensively out of class to develop their reading fluency. Students will study the specialist vocabulary in the context of published listening and reading materials produced particularly for these ESP situations and also explore lexis within authentic sources. Groups will be managed according to specialist areas and students will be expected to work extensively outside class contact time. Emphasis will be placed on integrating this module to work done within the International Foundation option module programme

Student Workload (SWL) الحمل الدراسي للطالب
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Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Reading Comprehension
Week 2	Writing I
Week 3	Writing I
Week 4	Learning English through Literature
Week 5	Advanced Reading
Week 6	Linguistics
Week 7	Advanced Writing
Week 8	Grammar I
Week 9	Grammar II
Week 10	Introduction to Literature
Week 11	Debate and Dialogue

Week 12	General Translation
Week 13	Listening & Speaking
Week 14	Listening & Speaking
Week 15	Exam
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Haarman et al. <i>Reading Skills for the Social Sciences</i> . OUP Cotton, D. et al. <i>Business Class</i> . Nelson	NO
Recommended Texts	An appropriate selection of Collins Specialist English Dictionaries, ArangeofA-leveltypeStudyGuides	No
Websites		

Grading Scheme مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Organic chemistry		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO1207		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Mohammed Abdul Baset	e-mail	Mohammedbaset1980@gmail.com
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. On completion of this module students should be able to: 1. Understand the structures of organic molecules and recognize and name examples of them. 2. Predict the properties and reactions of a molecule from its structure. 3. Discuss the reactions of common organic compounds. 4. Design the synthesis of a simple molecule from available starting materials. 5. Understand the molecular basis of life. 6. Safely perform a simple chemical synthesis in the laboratory. 2. 7. Understand the structures of organic molecules and recognize and name examples of them. 8. Predict the properties and reactions of a molecule from its structure. 9. Discuss the reactions of common organic compounds. 10. Safely perform a simple chemical synthesis in the laboratory.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successfully completing the module you will be able to... 1. Evaluate and choose appropriate reducing or oxidising agents for selective functional group transformations 2. Design protecting group strategies to enable chemoselective transformations to be carried out 3. Perform retrosynthetic analysis on complex organic molecules 4. Devise multi-step syntheses of complex organic molecules 5. Discuss the mechanisms of important organic transformations 6. Explain how synthetic procedures can be modified to allow the simultaneous generation of a wide range of structurally related compounds and address environmental issues
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Module content: <u>Part A:</u> • identify and draw organic compounds. (10 hrs) • provide the IUPAC name for some organic compounds. (8hrs.) • classify alcohols. (7hrs.) • explain the properties of alcohols and ethers. (5hrs.)

	Revision problem classes. [6hrs.] <u>Part B:</u> • Some organic chemistry fundamentals, basic concepts and terminology.(8hrs.) • Naming and classification of organic compounds.(7hrs.) • Basic reactions of alcohols, ethers and carbohydrates. (9hrs.) • Natural polysaccharides: modification and utilization in various applications.(5hrs.) • Group work (including presentation and evaluation of the other group works). (10hrs.)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module builds upon the entry-level knowledge of students covered in A-Level Chemistry. It introduces basic chemical concepts within the context of Organic Chemistry, and starts to develop the more specialist knowledge of organic reactions required for later modules. The latter will be further developed in the Organic Chemistry 2 module. The module will include: 1. General concepts in organic chemistry for predicting atom and electronic structure of molecules, stability, reactivity and molecular properties (bond strength, pH etc.) 2. General concepts and mechanisms underlying organic reactions and ability to draw the mechanism for a given reaction or to give reagents required for an organic reaction.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	An Introduction to Organic Chemistry
Week 2	Nomenclature of hydrocarbon
Week 3	Nomenclature of hydrocarbon and stereo chemistry
Week 4	Hydrocarbons
Week 5	Unsaturated Hydrocarbons
Week 6	Aromatic Hydrocarbons
Week 7	Mid-term Exam
Week 8	Organic Halogen Compound
Week 9	Alcohols and Phenols
Week 10	Ethers, Aldehydes and ketones
Week 11	Cyclic compound
Week 12	Carboxyl acid, Esters and Sulfonic acid
Week 13	Nitro compounds, Amines and Amides
Week 14	Exam
Week 15	Preparatory week before the final Exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Material Safety Data Sheet (MSDS)
Week 2	Lab 2: Determination of melting points
Week 3	Lab 3: Determination of boiling points
Week 4	Lab 4: Recrystallization
Week 5	Lab 5: Density of Some Organic Compounds
Week 6	Lab 6: Identification tests of Alkanes, Alkenes, Alkynes and Aromatic
Week 7	Mid-Exam
Week 8	Lab 7: Identification tests of primary, secondary and ternary alcohol
Week 9	Lab 8: Identification tests of Ketones and Aldehydes
Week 10	Lab 9: Identification tests of flash point
Week 11	Lab 10: exam theoretical
Week 12	Lab 11: exam practical
Week 13	Application by identification organic compound
Week 14	Application by identification organic compound
Week 15	Reiew before final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	J. Clayden, N. Greeves and S. Warren, Organic Chemistry (Second Edition), Oxford University Press, 2012, ISBN 0-19-927029-5 (essential core text)	Yes
Recommended Texts	C. Willis and M. Wills, Organic Synthesis, (Oxford Chemistry Primer 31), Oxford University Press, 1995, ISBN 0-19-855791-4	No
Websites	ELE page: https://vle.exeter.ac.uk/course/view.php?id=9255	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Molecular Biology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 1209		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Thamer Mouhi Jassem		e-mail: thamerm@kus.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Mustafa Abdul Hussein Abdul Ameer	e-mail	Mustafa.a@kus.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق.أ.م. / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The overall module aims are to: 1. Provide grounding in molecular biology. 2. Provide students with a comprehensive understanding of the fundamental principles, concepts, and techniques in molecular biology. 3. The equip students with the knowledge and skills necessary to analyze and manipulate biological molecules, 4. unravel molecular mechanisms underlying cellular processes, 5. Apply molecular biology techniques in various research and practical contexts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate an understanding of the structure and function of DNA, RNA, proteins, and lipids, and their roles in cellular processes. 2. Explain the mechanisms of gene expression and regulation, including transcription, translation, and epigenetic modifications. 3. Apply knowledge of DNA replication, repair, and recombination to explain how genetic information is maintained and passed on. 4. Analyze and interpret genetic variations and their inheritance patterns, including Mendelian genetics, population genetics, and complex traits. 5. Apply molecular biology techniques, such as DNA cloning, PCR, DNA sequencing, gene expression analysis, and genetic engineering, in laboratory settings. 6. Recognize the interdisciplinary nature of molecular biology and its integration with other fields such as genetics, biochemistry, cell biology, and biotechnology.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A -1 - Fundamentals of Molecular Biology</u> <u>Introduction to Molecular Biology:</u> Historical overview and significance of molecular biology. Central dogma of molecular biology: DNA replication, transcription, and translation. Structure and Function of Biological Macromolecules. (14 hrs.) DNA structure: double helix, base pairing, and DNA supercoiling. RNA structure and types: messenger RNA (mRNA), transfer RNA (tRNA), and ribosomal RNA (rRNA). (15 hrs.) Revision problem classes. (6 hrs.) <u>Part A- 2- Transcription: initiation, elongation, and termination.</u> Translation: ribosomes, transfer RNA, and protein synthesis. Regulation of gene expression: transcription factors, enhancers, and repressors. Epigenetics:DNA methylation, histone modifications, and chromatin remodeling.(15 hrs.)

	DNA Replication, Repair, and Recombination: DNA replication: enzymes, replication forks, and DNA proofreading. DNA repair mechanisms: base excision repair, nucleotide excision repair, and mismatch repair.(10h) <u>Part B - Molecular Biology Techniques and Applications</u> <u>Molecular Biology Techniques:</u> DNA cloning: restriction enzymes, plasmids, and recombinant DNA technology. Polymerase chain reaction (PCR): amplification of DNA sequences. DNA sequencing: Sanger sequencing and next-generation sequencing methods.(15 hrs.)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Interactive Classes: The module will involve interactive lectures where students are encouraged to ask questions, participate in discussions, and share their insights. The instructor will employ various teaching methods such as case studies, multimedia presentations, and group activities to facilitate active learning and promote a deeper understanding of the concepts. Hands-on Laboratory Experiments: Practical laboratory work will be an integral part of the module to give students hands-on experience in molecular biology techniques. The experiments will be carefully designed to align with the theoretical concepts covered in the lectures. These activities will not only reinforce the theoretical knowledge but also develop the students' practical skills, scientific reasoning, and attention to detail.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Genetics
Week 2	Basic Concepts of Genetics , Branches of genetics
Week 3	The Search for the Genetic Material: Griffith's Transformation Experiment Avery's Transformation Experiment
Week 4	The Hershey-Chase Bacteriophage Experiment: The Discovery of RNA as Viral Genetic Material
Week 5	Mid-term Exam1
Week 6	The Composition and Structure of DNA and RNA
Week 7	The Discovery of the DNA Double Helix:
Week 8	The Organization of DNA in Chromosomes
Week 9	DNA Replication
Week 10	Mid-term Exam 2
Week 11	DNA Replication in Eukaryotes:
Week 12	Replicating the Ends of Chromosomes:
Week 13	RNA Transcription, Transcription in Eukaryotes:
Week 14	Translation
Week 15	A preparatory week before the final exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Lab safety: Types of hazards in molecular biology lab:
Week 2	Lab 2: Extraction of Genomic DNA from Blood
Week 3	Lab 3: Genomic DNA Extraction from Plant Tissue
Week 4	Lab 4: Assignments
Week 5	Lab 5: Characterization of DNA by Spectrophotometric Assay and Melting Temperature (T _m)
Week 6	Lab 6: Agarose Gel Electrophoresis
Week 7	Lab 7: Midterm Exam
Week 8	Lab 8: Assignments
Week 9	Lab 9: Polymerase Chain Reaction 1
Week 10	Lab 10: Polymerase Chain Reaction 2
Week 11	Lab 11: Optimization of Annealing Temperature
Week 12	Lab 12: PCR Troubleshooting
Week 13	Lab 13: Digestion of DNA with Restriction Enzymes
Week 14	Lab 14: Sanger Sequencing
Week 15	A preparatory week before the final exam
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Molecular Cell Biology , Eighth Edition , Harvey Lodish Arnold Berk Chris A. Kaiser Monty Krieger Anthony Bretscher Hidde Ploegh Angelika Amon Kelsey C. Martin	Yes
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	General Microbiology		Module Delivery	
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MBO 12108			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	1	Semester of Delivery		2
Administering Department	MBO	College	SC	
Module Leader	Dr. Hiba Shakir Ahmed		e-mail	hiba.sh@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	-----		e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein		e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/02/2024		Version Number	ق.أ.م / 508

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	General Biology (MBO 11001)		Semester	1
Co-requisites module	Bacteriology (MBO 21116)		Semester	1

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعليم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Determine the most important characteristics of microorganisms 2. Learn about diseases caused by microorganisms 3. Identify the factors that limit the growth of microorganisms 4. Classification of microorganism and their kingdom (most important characteristics for each) 5. Learn about the methods of isolating and purifying microorganisms (obtaining pure isolation) 6. Identify bacterial communities and staining of bacteria and spores. 7. Effect of antibiotics and some agents on bacterial isolates.
Module Learning Outcomes مخرجات التعلم المادة الدراسية	The student will acquire the following knowledge and skill: 1. The most important characteristics of microorganisms, according to genus and species 2. Distinguish between forms of microorganisms and determine the method of microscopic and biochemical examination 3. Diseases caused by microorganisms and the causes of infection 4. Natural and industrial factors that limit the growth of microorganisms 5. Apply their knowledge of microbial structure, growth, and metabolism to the identification of unknown microorganism. 6. Knowing the methods of preventing microbial infections
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A - Microbes and Their Building Blocks</u> Microbes - Tiny but Mighty, History of Microbiology, Naming, Classifying, and Identifying Microorganisms, Macromolecules (Superstructures of Life). [10 hrs.] <u>Part B - Bacteria Prokaryotic Structure</u> Bacteria - Form and Function of Bacteria, External Structures, The Wall and Membranes, Bacterial Internal Structures, Classification Systems for Bacteria. [9 hrs.] <u>Part C - Microbial Nutrition and Growth</u> Microbial - Their Nutrition, Environmental Factors That Influence Microbes, Bacterial Growth, culturing of microbes. [10 hrs.] Revision problem classes. [6 hrs.] <u>Part D – Microbial Metabolism</u> Metabolism and the Role of Enzymes, The Pursuit and Utilization of Energy, Catabolism, Anabolism and Crossing Pathways of Metabolism. [10 hrs.]

	<u>Part E – Microbial Genetics</u> Introduction to Genetics and Genes, Transcription and Translation, Genetic Regulation of Protein Synthesis, DNA Replication and Recombination Events, Mutations (Changes in the Genetic Code). [10 hrs.]
	<u>Part F – Viral Structure and Multiplication</u> The Position of Viruses in the Biological Spectrum, General Structure of Viruses, Models of Viral Multiplication, Techniques in Cultivating and Identifying Animal Viruses, Other Noncellular Infectious Agents, Viruses and Human Health. [11 hrs.]
	<u>Part G – Eukaryotic Cells and Microorganisms</u> Structures of the Eukaryotic Cells. The Fungi – Classification, structure, function. The Protozoa - Classification, structure, function. [9 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Many strategies will be used in this module to encourage students to learn and develop their skills in microbiology such as participation in the exercises, seminars, lab experiments, and workshops related to the field of isolation, purification, and diagnosis of microorganisms, as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, interactive tutorials, and simple laboratory experiments that involve some activities of sampling, examining, and isolating its microbial community in ways that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب اسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	4, 8	LO #1, 2, 3, 5,6, and 7
	Assignments	2	10% (10)	5, 10	LO # 2, 4, 6, 8, and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Microbiology
Week 2	Branches of Microbiology
Week 3	Classification of Microbes
Week 4	Classification of Bacteria
Week 5	Bacteria Prokaryotic Structure and Functions
Week 6	Microbial Nutrition and culture of bacteria
Week 7	Bacterial growth and bacterial genetics
Week 8	Mid-term Exam (1)
Week 9	General properties of virus
Week 10	Viral Structure and Multiplication
Week 11	RNA and DNA virus
Week 12	Fungi structure
Week 13	Classification of fungi
Week 14	Important medical fungi
Week 15	Mid-term Exam (2)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: safety in laboratory
Week 2	Lab 2: sterilization and disinfection
Week 3	Lab 3: bacterial stain
Week 4	Lab 4: Gram stain
Week 5	Lab 5: wet mounts slide method
Week 6	Lab 6: medial preparation
Week 7	Mid-term Exam
Week 8	Isolation of Bacteria from environment
Week 9	Interpretation the result and colony diagnosis
Week 10	Fungi culture and identification
Week 11	Interpretation the result and diagnosis
Week 12	Protozoa
Week 13	Helminthis
Week 14	Mid exam (2)
Week 15	Revision

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Jawetz, Melnick & Adelerg's(2016). Medical Microbiology.17 edition	No
Recommended Texts	Warren Levinson (2020). Review of Medical Microbiology & Immunology	No
Websites	https://www.coursera.org/browse/microbiology-science	

Grading Scheme

مخطط الدرجات

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

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Physics		Module Delivery
Module Type	BASIC		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	SCI12012		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	2
Administering Department	MBIO	College	SC.
Module Leader	Amer Basim Shaalan		e-mail: ame72r@kus.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	N.A		e-mail: N.A
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To have knowledge about General Physics basic principles like Mechanics of motion, liquid mechanics and electricity. 2. To get skills in solving mathematical problems that related to physics subjects. 3. To get practical skills in managing physics experiments in the lab. and record measurements and then calculate required quantities. 4. Analysis the physical information in syllabus and be able to make conclusions by joining between physical concepts. 5. To be able to apply his knowledge in physics in market.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Save in memory basic principles and laws of physics. 2. Produce scientific concepts by joining between physical principles. 3. Joining physical concepts to produce more complicated concepts. 4. The ability to make conclusions by analysis the physical information. 5. The ability to apply all his knowledge to solve problems in reality. 6. To be able to run the devices and apparatus in the lab. 7. Assemble devices and make an experiment to prove physical relation. 8. Discuss the results get from running experiment in the lab. 9. Make reports from theory to conclusion about any physical concept proved in the lab.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Measurement units, Motion in one dimension, path and displacement, velocity and acceleration. [18 hrs] Free fall motion, gravity, projectile path. [10 hrs] Vector Analysis, Unit vector, Vector addition and subtraction, resultant vector and its direction. [14 hrs] Motion in two dimensions, concept of negative acceleration, average and instantaneous velocity and acceleration. [15 hrs] Revision problem classes [8 hrs]

	Newton laws of motion, principle of continuity, equilibrium, action and reaction, force analysis diagramme. [18 hrs] Circuits and electricity, Current, Voltage, Resistance. [7 hrs] Fluid Mechanics, Pascal principle, Archimedes principle, Pressure, Bernoulli equation in fluid flow. [10 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	100	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Physical unit systems and unit conversion
Week 2	Motion in one dimension: velocity and acceleration
Week 3	Free fall motion and gravity
Week 4	Vector analysis: vector addition and subtraction
Week 5	Unit vector and vector resultant calculation
Week 6	Motion in two dimension: velocity and acceleration calculations
Week 7	Mid-term Exam
Week 8	Newton first law of motion: object in equilibrium concept
Week 9	Newton second law of motion: acceleration and deceleration
Week 10	Newton third law of motion: action and reaction
Week 11	Electricity: current, voltage and resistance, Ohm's law
Week 12	Electric circuits: series and parallel circuits
Week 13	Fluid mechanics: pressure and Pascal Principle
Week 14	Archimedes principle
Week 15	Bernoulli equation in fluid flow
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1+2	Lab 1+2: Introduction to diagrams and report writing
Week 3+4	Lab 3+4: Surface tension
Week 5+6	Lab 5+6: Force equilibrium

Week 7	Midterm Exam
Week 8+9	Lab 8+9: Static and dynamic friction
Week 10+11	Lab 10+11: Ohm's law
Week 12+13	Lab 12+13: Series and Parallel circuits
Week 14+15	Lab 14+15: Density of materials

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Applied Physics by Schaum 2013	No
Recommended Texts	Physics for scientists and engineers by Serway 2004.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	General Biology		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	SCI 1104			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	1	Semester of Delivery		1
Administering Department	MBO	College	SC	
Module Leader	Dr. Sraa Nsayef Muslim		e-mail	Sraa.N.Muslim@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	-----		e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein		e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/06/2023		Version Number	ق.أ.م. / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Give a general understanding of the types, divisions, and components of organisms. 2. Understand the effect of organisms on humans and their environments. 3. Gain practical knowledge of the classification of organisms 4. Complete the reports, seminars, and presentations to develop the student's skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the most important differences between animals, plants, and microorganisms 2. Identify the processes of evolution in the organisms and the theories of their emergence 3. State the divisions of the plant kingdom and the animal kingdom 4. Identify the types of animal and plant tissues 5. Identifying the interdependent relationship between animals and plants.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A - Life and science</u> Life - Characteristics of life, The scientific method, Development of the scientific attitude, Biology today, Biology as a science. [22 hrs.] <u>Part B - Different forms of life</u> The kingdoms of organisms - The animals, plants, and Monera, Their structure, Components, Functions, and Classification. [10 hrs.] Revision problem classes. [6hrs.] <u>Part C - Chemistry of life</u> Matter and elements - How elements differ, Structure of matter, Chemical bonding, Ionic bonding, Inorganic compounds, and Organic compounds. [22 hrs.] <u>Part D – Cells in Life</u> Cells - The cell theory, The cell and its parts, Prokaryotic, and eukaryotic cells, Compare and contrast between plant and animal cells, The cell membrane/Wall, The cell membrane/Wall structure and function, and The transport of materials across the membrane. [19 hrs.] <u>Part D – Cell life cycle</u> Cell Cycle - Control of cycle, Interphase (Gap I phase, Synthesis phase, and Gap II phase), Mitosis (Prophase, Metaphase, Anaphase, and Telophase), Meiosis. [21 hrs.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Many strategies will be used in this module to encourage students to learn such as participation in the exercises, seminars, lab experiments, and workshops, as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some interesting sampling activities for the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	100	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب اسبوعيا	6.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	4, 8	LO #1, 2, 3, 5,6, and 7
	Assignments	2	10% (10)	5, 10	LO # 2, 4, 6, 8, and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the life science
Week 2	The characteristics of life
Week 3	The characteristics of organisms
Week 4	The kingdom of organisms
Week 5	Classification of Animal and plant Kingdoms
Week 6	Kingdom Monera
Week 7	Mid-term Exam
Week 8	Chemistry of life (1)
Week 9	Chemistry of life (2)
Week 10	Cell structure and function (1)
Week 11	Cell structure and function (2)
Week 12	Cell life cycle
Week 13	Mitosis
Week 14	Meiosis
Week 15	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Lab 1,2: Microscope and cell structure
Week 3,4	Lab 3,4: Cell behavior
Week 5,6	Lab 5,6: Respiration
Week 7,8	Lab 7,8: Photosynthesis
Week 9,10	Lab 9,10: Mitosis
Week 11,12	Lab 11,12: Meiosis
Week 13,14	Lab 13,14: Gametogenesis
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biology: Concepts and Connections; Campbell, Reece, Taylor, and Simon; Latest edition 2018	No
Recommended Texts	The Science of Biology by Sadava, Hillis, Heller and Berenbaum 9th ed. 2011	No
Websites	https://www.coursera.org/browse/biology-science	

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	Fundamental of Computer Science		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	KUS 1102			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	1	Semester of Delivery		1
Administering Department	MBo	College	SC	
Module Leader	Dr. Nora Hikmat Mutasher		e-mail	dr.nora.hikmat@kus.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.
Module Tutor	Lecturer Eng. Ahmed Sobri		e-mail	eng.ahmed.sabri@kus.edu.iq
Peer Reviewer Name	Dr. Saad Hussein		e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	17/06/2023	Version Number	ق/أ.م/ 508	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The computer course includes in the theoretical side the basics of computers, as well as a brief historical summary on the development and generations of computers also Computer Types. A detailed explanation of the Computer Components (Hardware and Software); addition to the student's definition of Numbers Systems (Decimal & Binary); the last axis comes about introducing the student to the Internet and the Intranet. As for the practical side, the student is taught the ready-made basic programs that include Microsoft Office and the Windows operating system, as the course includes practical hours, so the most important output is the student's mastery in dealing with the calculator as an easy tool to work with.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The learning outcomes of studying medical image analysis include: 1. Defining computer components (hardware and software) to the students. 2. Explaining input and output devices to the students. 3. Enabling students to recognize different types of memory. 4. Teaching students about number systems and how to convert between decimal and binary. 5. Defining the Internet and Intranet to students and discussing the similarities and differences between the two. 6. Providing hands-on experience with basic programs, including Microsoft Office and the Windows operating system, to students.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A</u> Introduction to Computer, Definition of Computer, Computer History, Generations of Computers, Categories of Computer. [6 hrs] <u>Part B</u> Computer Components, Software. [3 hrs] <u>Part C</u>

	Computer Components, Hardware, Input Devices, Output Devices, Components of the System Unit, Central Processing Unit (CPU), Memory. [6 hrs] <u>Part D</u> Hardware, Cache Memory, Primary, Memory (Main Memory) ,Random Access Memory, Read Only Memory, Secondary Memory, Memory Units, Storage Devices. [5 hrs] <u>Part E</u> Numbers Systems, Decimal Number System, Binary Number System, Convert Decimal to Binary System, Examples, Convert Binary to Decimal System, Examples. . [6 hrs] <u>Part F</u> Defining Internet and Intranet, Types of Computer Network, Computer network. [4 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In order to enable students to learn computer skills effectively, here are some strategies that can be employed: 1. Provide hands-on activities: Incorporate hands-on activities, projects, and exercises to engage students actively in the learning process. Practical application of concepts helps students understand how computers work and reinforces their understanding. 2. By using visual aids and interactive resources: Utilize visual aids, diagrams, charts, and interactive resources like educational software, simulations, and coding platforms to make abstract concepts more tangible and engaging. 3. Foster a collaborative learning environment: Encourage students to work in teams or pairs on projects or coding exercises. Collaborative learning allows students to share ideas, help one another, and learn from different perspectives. 4. Personalize the learning experience: Recognize that students have different learning styles and paces. Provide opportunities for individualized learning, allowing students to progress at their own speed and explore topics of interest to them. Tailor the learning experience to accommodate diverse learning needs. 5. Encourage exploration and experimentation: Encourage students to explore and experiment with different programming languages, tools, and

	technologies. Let them pursue their own coding projects and interests. This fosters curiosity and self-directed learning. 6. Connect with real-world applications: Demonstrate how computer skills are applied in various fields and industries. Show examples of how coding is used in creating websites, mobile apps, robotics, or data analysis. Connecting computer skills to real-world applications can motivate students and help them understand the practical significance of what they are learning. 7. Through updated with technology trends: Stay abreast of the latest technology trends, tools, and programming languages. Integrate relevant and up-to-date content into the curriculum to ensure students are learning skills that are in demand in the job market. It is important to create a supportive and inclusive learning environment where students feel encouraged to ask questions, take risks, and explore their interests. By implementing these strategies, we can help students develop a solid foundation in computer skills and foster their passion for technology.
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Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	5% (5)	4, 8	LO # 1,2,3,5,6, and 7
	Assignments	2	5% (10)	10, 14	LO # 8, 9, 11,12 and 13
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	15	LO # 4,14
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO # 1-8
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Computer, Definition of Computer
Week 2	Computer History, Generations of Computers,
Week 3	Categories of Computer.
Week 4	Computer Components, Software
Week 5	Computer Components, Hardware, Input Devices
Week 6	Computer Components, Hardware, Output Devices
Week 7	Computer Components, Hardware, Components of the System Unit, Central Processing Unit (CPU), Memory
Week 8	Mid-term exam
Week 9	Hardware, Cache Memory, Primary, Memory (Main Memory)
Week 10	Hardware, Random Access Memory, Read Only Memory
Week 11	Hardware, Secondary Memory, Memory Units, Storage Devices
Week 12	Numbers Systems, Decimal Number System, Binary Number System
Week 13	Numbers Systems, Convert Decimal to Binary System, Examples
Week 14	Numbers Systems, Convert Binary to Decimal System, Examples
Week 15	Defining Internet and Intranet, Types of Computer Network, Computer network

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1+2	Lab 1+2: Windows 10: An introduction to windows 10, The start menu, Notification pane and action center.
Week 3+4	Lab 3+4: Cortana, Microsoft edge, Use multiple desktops, Tablet mode, The settings App.
Week 5+6	Lab 5+6: Microsoft word 2016: An introduction to Microsoft Word 2016, Starting Word, The Home Ribbon: Using Paragraph Styles, Bold, Italic & Underlined, Superscript & Subscript, Highlighting Text, Text Colour, Text Justification, Paragraph Indents, Bullet Lists, Numbered Lists, Cut, Copy & Paste.
Week 7+8	Lab 7+8: The Insert Ribbon: Inserting Symbols, Equations, Cover Pages, Adding Images, Adding Effects to Images, Cropping Images, Wrap Text around Images, Adding Tables, Formatting Tables, Add a Column, Insert a Row, Resizing Rows & Columns, Headers and Footers, Inserting Headers & Footers, Editing Headers & Footers.

Week 9	Mid-term exam
Week 10+11	Lab 9+10: Page Numbering: The Design Ribbon (Page Borders, Page Color, Watermarks, Page Numbering: The Page Layout Ribbon, Page Setup, The References Ribbon, The Mailings Ribbon, The Format Ribbon, File Backstage, Saving Documents, Saving as a Different Format, Opening Saved Documents, Printing Documents.
Week 12+13	Lab 11+12: Microsoft Excel 2016: An introduction to Microsoft Excel 2016, Starting Excel, The Home Ribbon, The Insert Ribbon, The Page Layout Ribbon, The Formulas Ribbon, The Data Ribbon, The Review Ribbon, The View Ribbon, File Backstage, Introduction to a Spreadsheet, Entering Data.
Week 14+15	Lab 13+14: Simple Text Formatting, Text Orientation, Resizing Rows and Columns, inserting Rows & Columns, Cut, Copy & Paste, Sorting Data, Formatting Spreadsheet, Cell Alignment, Text Format, Cell Borders, Using Formulas, Using Functions, Count, Count IF, Auto Sum, Average, Max & Min, IF Function, Adding Charts, Change Chart Type.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- Ata Elahi, "Computer Systems, Digital Design, Fundamentals of Computer, Architecture and Assembly Language", Springer International Publishing AG 2018. 2- Peter Norton "Introduction to Computers", sixth Edition, 2008, ISBN-13:978-0-07-059374-9. 3- B. Hemanta, Computer Fundamental, Stratford College London, pp.1-20. 4- R Mansfield, "Mastering VBA for Microsoft Office", 2019, 944 Pages.	Yes
Recommended Texts	1- Steven Freund, Gary B. Shelly, Thomas J. Cashman, Misty Vermaat, Introduction to Computers, Eighth Edition, 2012, ISBN10 143908131X, ISBN13 9781439081310	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	Fermentation Technology		Module Delivery
Module Type	Support		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 1106		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Dr. Taif Hussain Hassan		e-mail
		Taif.h.salman91@kus.edu.iq	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Asmaa Sami	e-mail	asmaasami@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Learn the role of microorganisms in fermentation and gain skills to control the fermentation processes. 2- To empower the students with various types of fermenters. 3- To acquaint students with the technical and biological aspects of microbial utilization for the production of metabolites. 4- To gain knowledge about fermentation technologies used in microbial industries. 5- To knowledge the students about the fermentation process by manipulating microbes for improvement. 6- Through problem sets, exams, and quizzes in this module the students will demonstrate the ability to engage in scientific as well as quantitative and qualitative reasoning. 7- Complete the reports, seminars, and presentations to develop the student's skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completion of this module, students will be able to understand: 1- The process of isolation, selection, and improvement of microbial cultures. 2- The industrial sterilization methods, types of fermenters, recovery, and purification of fermentation products, and 3- The knowledge of growth kinetics in batch, continuous, and fed-batch cultures. 4- The ability to find or update information about the various requirements of scaling up from small-scale to large-scale for industrial fermentation processes.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A - Introduction to Fermentation Technology</u> Scope and Development of Fermentation technology, Isolation and screening of major types of organisms used in fermentation, primary and secondary screening, Maintenance of Strains, Strain improvement, Mutant selection, and Recombinant DNA technology. [10 hrs] <u>Part B - 2- Fermentation media and Fermentation inoculums</u> Natural and Synthetic media; Basic components of a media (Carbon sources; Nitrogen sources; Vitamins; Minerals; Anti-foaming agents); Role of buffers in media. Isolation, preservation, and development of inoculum for lab and industrial fermentations. [12 hrs] Revision problem classes. [6 hrs] <u>Part C - Fermentor types and design</u> Basic designs and functions of Fermentor. Type of fermenters, aerobic and anaerobic fermentation. Scale up and development; Regulation and safety. [15 hrs] <u>Part D – Fermentation Products and Recovery</u> Types of fermentation – submerged and solid-state fermentation. Modes of fermentation – Batch, continuous, and fed-batch cultures. Development (from shake flask to 2L scale for 1st time) and Optimization of the fermentation process by physiological and genetic strategies. Production of primary and secondary metabolites. Upstream and Downstream processing and Product recovery. [13 hrs]

	Part E – Fermentation Control Requirements for control, design of fermentation control systems by sensors, and controllers, control of incubation, aeration, and agitation. common measurements, and control systems. Solutions to common problems in fermentation. [13 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Several techniques and explanation methods will be used in this module to increase students' ability to learn in the fermentation technology module by encouraging students' participation in exercises, seminars, projects, and workshops, in addition to using non-traditional learning methods such as the use of educational videos and electronic simulation equipment to improve scientific and critical thinking skills are expanded. This will be achieved through the use of the foregoing during the theoretical and practical educational classes, using simple and interesting methods that include types of simple experiments for students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	70	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.66
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	80	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	5% (5)	3, 6, 9	LO # 1-9
	Assignments/ Lab	3	15% (15)	4, 8, 12	LO # 1-12
	Projects	1	10% (10)	14	LO # 14
	Report	1	10% (10)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Fermentation Technology I
Week 2	Introduction to Fermentation Technology II
Week 3	Introduction to Fermentation Technology III
Week 4	Fermentation media and Fermentation inoculums I
Week 5	Fermentation media and Fermentation inoculums II
Week 6	Fermentation media and Fermentation inoculums III
Week 7	Mid-term Exam
Week 8	Fermentor types and designs I
Week 9	Fermentor types and designs II
Week 10	Fermentation Products and Recovery I
Week 11	Fermentation Products and Recovery II
Week 12	Fermentation Products and Recovery III
Week 13	Fermentation Products and Recovery IIII
Week 14	Fermentation Control
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1+2	Lab 1+2: Introduction to Fermentation Technology I
Week 3+4	Lab 3+4: Introduction to Fermentation Technology II
Week 5+6	Lab 5+6: Fermentation media and Fermentation inoculums I
Week 7+8	Lab 7+8: Fermentor types and designs I
Week 9+10	Lab 9+10: Fermentation Products and Recovery I
Week 11+12	Lab 11+12: Fermentation Products and Recovery IIII
Week 13+14	Lab 13+14: Fermentation Control I
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Peter F Stanbury, Allan Whitaker, Stephen J Hall. Principles of Fermentation Technology. (2016) Butterworth-Heinemann Press. UK.	No
Recommended Texts	Arnold L. Demain & Julian E. Davis. Industrial Microbiology & Biotechnology, ASM Press. (2004).	No
Websites	https://scholar.google.com/	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	الديمقراطية و حقوق الانسان		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	KUS 1103		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Mohanad Basim Ibrahim	e-mail	Mohanad.al.sallami@kus.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	6/11/2023	Version Number	ق/أ.م/ 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	non	Semester	
Co-requisites module	non	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	تهدف المادة الى بيان اهمية الحقوق الاصلية اللصيقة بالانسان، التي تتفق مع فطرته والتي يقبلها العقل المجرد، والتي لا تختلف باختلاف الزمان والمكان وهذه هي حقوق الانسان
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	تسهم المادة العلمية الى تنقيف الطالب من الناحية القانونية، ليكون مطلع على ماهية الحقوق الانسانية واصلها التاريخي وتعريف ماله من حقوق وما عليه من التزامات من خلال معرفة حقه وحدود ذلك الحق وحقوق الاخرين، وما سعت اليه الدول والمنظمات الدولية والاقليمية في تعزيز مفاهيم تلك الحقوق، والزام الدول للنص عليها في التشريعات الداخلية والضمانات التي تكفل تطبيق تلك الحقوق العالمية.
Indicative Contents المحتويات الإرشادية	ان المحتويات الارشادية لمادة الديمقراطية وحقوق الانسان تتلخص بتهذي الطالب (15 ساعة) وتعريفه ان تعامله مع غيره من بني البشر يقوم على مبدأ (ان الناس صنفان، اما اخ لك في الدين، او نظير لك في الخلق (15 ساعة)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	نعمد في هذا الجانب إلى ما يلي: 1. يعرف الطالب ابتداءً بمضمون موجز عن المفردات التي سيتم تناولها خلال المحاضرة، ثم توجه له بعض الأسئلة التي تحرك ذهنه، وتشد انتباهه؛ لضمان حسن الاستماع. 2. يتم التعمق بشرح المفردات العلمية في حدود تناسب متوسط المستويات العلمية لضمان عدم تجاوز الفروق الفردية عند عموم الطلبة. 3. يتم ترك مساحة للنقاش الحر في إطار الموضوع المخصص للمحاضرة. 4. الحرص على جانب التغذية الراجعة للمعلومات قبل نهاية المحاضرة. 5. التواصل إلكترونياً مع الطلبة لنشر المحاضرات المسجلة، والمكتوبة من خلال الموقع الرسمي للجامعة.
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Student Work load (SWL)

الحمل الدراسي للطلاب ل 15 اسبوعاً

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	30	Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	20	Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	1.3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	تعريف وطبيعة حقوق الانسان
Week 2	التطور التاريخي لحقوق الانسان
Week 3	مميزات حقوق الانسان عن غيرها من الحقوق
Week 4	حقوق الانسان في الديانات السماوية
Week 5	حقوق الانسان في المواثيق الدولية
Week 6	حقوق الانسان في التشريعات الداخلية
Week 7	حقوق الانسان الشخصية
Week 8	حقوق الانسان الاجتماعية
Week 9	حقوق الانسان الثقافية
Week 10	حقوق الانسان الاقتصادية
Week 11	ضمانات حقوق الانسان الدولية
Week 12	ضمانات حقوق الانسان الاقليمية
Week 13	ضمانات حقوق الانسان الداخلية (الوطنية)
Week 14	الجزاء المترتبة على المساس بحقوق الانسان
Week 15	امتحان نهائي

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	حقوق الانسان (تطورها، مضامينها، حمايتها)/ د. رياض عزيز هادي	Yes
Recommended Texts	حقوق الانسان/ د. حميد حنون	
Websites	https://www.noor-book.com/ https://www.un.org/ar/about-us/universal-declaration-of-human-rights https://ar.wikipedia.org/wiki	

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	Mathematic		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	KUS 1101		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Haleema swaidan ali	e-mail	haleemaswaidan@kus.edu.iq
Module Leader's Acad. Title	Proof.	Module Leader's Qualification	Ph.D
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق/أ.م/ 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	non	Semester	
Co-requisites module	non	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Introducing students to mathematical concepts in the subject of linear algebra and matrices. 2. Use and apply these concepts to solve applied problems. 3. Teach students to analyze results using mathematical methods. 4. Teaching students some special functions and their properties. 5. Teaching students to mix and combine mathematical concepts with practical problems. 6. Introducing students to the importance of mathematics
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Solving mathematical problems with scientific material. 2. Writing scientific reports and analyzing data. 3. Self-learning method. 4. Solving problems relevant with mathematical subject. 5. Testing the student's ability to solve mathematical problems related to the subjects he studied.
Indicative Contents المحتويات الإرشادية	<u>Part A:</u> 1. Introduction to Linear Algebra. (15 hrs) 2. Linear system -Linear Equations –Solution of Linear Equations. (12 hrs) 3. Matrix Algebra. (8) 4. Logarithmic function. (8 hrs) 5. Trigonometric functions. (7 hrs) 6. Exponential function. (12 hrs) 7. Techniques of integrations. (13 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Lectures: Providing students with basic mathematical concepts and their practical applications. 2. Forming discussion groups during lectures to discuss mathematics topics and solve practical problems. 3. Ask the students a set of thinking questions during the lectures, such as what, how, when and why for specific topics in mathematics. 4. Giving students homework that requires self-explanations in different ways. 5. Writing scientific reports and analyzing data. 6. solving problems relevant with mathematical subject.
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Student Work load (SWL) الحمل الدراسي للطالب ل 15 اسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (20)	5 and 10	Lo #2,#4,#6,#8,#10
	Assignments	2	5% (10)	2 and 12	Lo #1, #3,#5,#7,#9,#11
	Projects / Tut.	1	5%(5)	13	All
	Report	1	5% (5)	14	All
Summative assessment	Midterm Exam	2 hr	10% (20)	8	Lo #1-#8
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Matrices - the concept of matrices - some types of matrices- operations on matrices
Week 2	Determinants, Properties of the determinants ,Calculate the determinant of a 2x2 matrix and a nxn matrix.
Week 3	The Inverse - Matrix - Properties Of The Inverse - Matrix, The Transpose OperationProperties.
Week 4	practical - method for finding the Inverse the cofactor method.
Week 5	solution of linear systems using the inverse matrix- the adjutant inverse.
Week 6	solution of linear systems using The Cramer's rule.
Week 7	solution of linear systems using Gauss_ Jordan Elimination method.
Week 8	Slop of a line, equation of a line, types of line equation.
Week 9	Trigonometric functions - Derivation of trigonometric functions.
Week 10	Integration of Trigonometric Functions - Applications to Trigonometric Functions.
Week 11	Logarithmic function - properties of logarithmic function – derivation of logarithmic function.

Week 12	Integration of the logarithmic function-Applications to the logarithmic function.
Week 13	Exponential function - properties of the exponential function- derivation of the exponential function - integration of the exponential function.
Week 14	Techniques of integrations (by parts, tables)
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Larson, Ron, and Bruce H. Edwards. Calculus. Cengage Learning , Calculus 2022.	yes
Recommended Texts	Larson, Ron. Precalculus with limits. Cengage Learning.	yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Chemistry		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO11002		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Firas H. Abdulrazzak	e-mail	Firas_ald2020@yahoo.com
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م./ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1-To develop skills and understanding of different types of elements through the application of techniques. 2. To understand metals, physical and chemical properties. 3. This course deals with the basic concept of general chemistry. 4. To understand periodic table and distribution elements on it
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the classification of elements. 2. List the various terms associated with periodic table. 3. Summarize what is meant by a basic chemical property. 4. Discuss the reaction and involvement of atoms in chemical reaction. 5. Describe bonds, oxidation number, and Lewis term. 6. Identify the elements according to conductivity and their applications. 7. Discuss the electrons distribution in the atomic levels. 8. Identify the primary terms that used to characterized physical and chemical properties.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A-Circuit Theory Starting from atomic theory and electron distribution in the outer and inner shells the details required make enough information for the principle of chemistry. [14 hrs] Enhance the principle of general chemistry when highlight in more information about losing and acceptance electrons with the abilities for forming any bonds and forming new molecules with new properties. [13 hrs] Periodic table with highlight in the orientations of molecules to show different and variance in properties. [12hrs] . Revision problem classes [6hrs] Part B-Analogue chemistry 3-Fundamentals Electron configuration, oxidation number, The ratios of forming molecules. [15hrs] Components and active site. [8 hrs] Identification of general properties.[7 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	To describe the learning activities of the students and the teaching methods of the staff. Effective module design should result in a varied range of active learning experiences for students, including learning activities which are 'research-like'. Activities should, of course, motivate and encourage deep learning (reflection on wider meanings, rather than superficial memorisation of information). They should also be varied and flexible enough to accommodate different learning styles and orientations, and allow for inclusivity of students from different backgrounds and with different kinds of learning abilities. Learning activities therefore need to include reference to independent, interdependent (peer- supported) and online activities, as well as participation in different kinds of taught class.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	100	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Course introduction; What is biology?
Week 2	The nature of life
Week 3	Atomic structure and chemistry of water
Week 4	Carbohydrates, proteins, and lipids
Week 5	Nucleic acids
Week 6	Cells, Part I
Week 7	Exam Mid-term Exam
Week 8	Cells, Part 2
Week 9	Energy & metabolism, Part I
Week 10	Energy & metabolism, Part 2
Week 11	Cellular respiration, Part I
Week 12	Cellular respiration, Part 2
Week 13	Photosynthesis
Week 14	DNA & its role in heredity
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Measurement
Week 2	Lab 2: Course intro; Life and the scientific theory
Week 3	Lab 3: Enzyme function I
Week 4	Lab 4: Enzyme function 2
Week 5	Lab 5: Microscope & cell structure
Week 6	Lab 6: Cell behavior
Week 7	Lab 7: Respiration
Week 8	Lab 8 : Photosynthesis

Week 9	Lab 9 : Restriction digest of plasmids
Week 10	Lab 10: Gene transformation
Week 11	Lab 11: Mitosis, meiosis, and gametogenesis
Week 12	Lab 12: Mendelian crosses
Week 13	Lab 13: Outcomes of evolution
Week 14	Lab 14: Blood Typing 1
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Freece J, Urry L, Cain M, Wasserman S, Minorsky P, Jackson, R. (Eds) 9th Global Edition, 2011, Campbell Biology, Pearson Benjamin Cummings.	Yes
Recommended Texts	Butler, J. (2005) Forensic DNA Typing 2nd Ed. Elsevier (MA) ISBN: 9780121479527 Forensic Science – Jackson A.R. & Jackson J., Prentice Hall, ISBN: 130432512	No
Websites	https://www.aqa.org.uk/subjects/science/as-and-a-level/biology-7401-7402/subject-content	

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	Baath Crimes in Iraq		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	KUS 23016			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery		1
Administering Department	MBO	College	SC	
Module Leader	Dr.Fatimah Khalaf		e-mail	Fatimah.Khalaf @kus.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D
Module Tutor	-----		e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein		e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق.أ.م / 508	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	ارتكب نظام البعث في العراق إبّان حكمه عددا كبيرا من الجرائم المختلفة، واختلافها يلزم بيان مفاهيم وتعريف للطالب ليكون على معرفة ودراية بما يمر به مما لها علاقة بمادة المنهاج ، كمفهوم الجريمة وأقسامها، والجرائم الدولية التي حكم عليها قيادات وأزلام نظام البعث و فق قانون المحكمة الجنائية العراقية العليا، وعليها سيكون هذا الفصل في مبحثين، المبحث الأول في بيان مفهوم الجرائم وأقسامها، والمبحث الآخر في بيان جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا لسنة ٢٠٠٥ م.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- تسليط الضوء على جرائم ما ارتكبها نظام جائر في العالم كله على تعاقب الأزمان كتلك التي ارتكبها (نظام البعث) على صعيد العراق خاصة ، والمنطقة الإقليمية عامة ، والعالم كله شمولاً. 2- لقد جثم نظام البعث البائد على صدر العراق والعراقيين زهاء أربعة عقود يستقي سياسة تسلطهم من رضاع غ تاة الطغاة حقب التاريخ ك(قابيل ، والنمرود ، وفرعون ، وأبي لهب ، والحجاج ، ويزيد ، وهولاكو ، وموسيليني ، وهتلر (بما يتناسب ونشأة رأسه الطاغية وعدو الإنسانية) صدام حسين (المقبور ؛ فذاق ويلات بطش هذا النظام كل من انتهج سبيل الحق وحُب الوطن ؛ فرفض النهج البعثي العفن ، واكتوى بنار قمعه من صنوف المآسي والمحن. 3- لقد تحصل من هذا الواجب التربوي - التعليمي (الشرعي - الرسمي) أن تكلف لجنة وزارية مختصة تعنى بوضع منهج يؤثق بعضا من) جرائم النظام البعثي (؛ ليكون مبصر حقيقة يشرف به الشباب الجامعي الحالي على ما مضى من حياة عقود من حكم العراق بيد طاغية شيطان بهيأة إنسان فيستحضرون من إطلاعهم على أفصله ومضامينها ما يجعلهم على هدى يدرون به كل تعمية إعلامية تحاول تضليلهم ؛ فيمنعون به كل عمى.
Indicative Contents المحتويات الإرشادية	ارتأت اللجنة - التي عاش رئيسها وأعضاؤها كافة مدة الحكم البعثي المجرم ، وذاقوا من ويلات ا بصدق ومصاديق - بعد رحلة توثيقية ببطشه ما يجعل هذا المنهج المقرر للمنظومة الأكاديمية الجامعية موضوعاً حضورياً ، وإلكترونية أن يأتي هذا المنهج المقرر على مقدمة هي التي بين يدي الطالب الجامعي (5 س) ، والقارئ يستنير بها للمضمون كله بدواعي تأليفه ، ومسوغات إقراره ، ودوافع تدريسه ، ثم أربعة أفصل وُظفت أولها لتوثيق) جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥ م (، وجعل ثانيها لكشف) الجرائم النفسية والاجتماعية ، وآثارها ، وأبرز انتهاكات النظام البعثي في العراق (، وكُرس ثالثها لتبيين) الجرائم البيئية لنظام البعث في العراق (5 س)، أمّا الفصل الرابع والأخير فقد خُصص ل)جرائم المقابر الجماعية (، ثم ختم المنهج بملخص شافٍ وافٍ يضغ الحقائق مواضعها مما مرّ العرض له ، والاستدلال عليه. لقد تضمن هذا المنهج ما جاء مفاتيح معرفية بيد الطالب الجامعي يقوى بها على كل مرتج حباكّت رواية أكذوبته أيادي البعث وإعلامه المزيف ، وباعت ضميرها أنفساً ترى أن تبقى إلى الآن ذليلة أسيرة ، وذليلاً تابعاً (7 س).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	هذا الواجب التربوي - التعليمي الشرعي - الرسمي (أَنْ تَكُلَّفَ لَجَنَةُ وزارية مختصة تُعْنَى بوضع منهج يُوثَّقُ بعضاً من) جرائم النظام البعثي (؛ ليكون مَبَصَّرَ حقيقة يَشْرَفُ به الشباب الجامعي الحالي على ما مضى من حياة عقودٍ مِنْ حُكْمِ العراق بيد طاغية شيطان بهيأة إنسان ؛ فيستحضرون من أطلّاعهم على أفصلها ومضامينها ما يجعلهم على هدى يدرون به كلَّ تَعْمِيَةٍ إعلاميةٍ تُحاولُ تضليلهم ؛ فيمنعون به كلَّ عَمَى.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	المقدمة / جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥ م
Week 2	الفصل الأول: ١/١ . مفهوم الجرائم وأقسامها ١/١/١ . تعريف الجريمة لغة واصطلاحاً
Week 3	أقسام الجرائم. ١/٢ . جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥ ١/٢/١ . أنواع الجرائم الدولية
Week 4	القرارات الصادرة من المحكمة الجنائية العليا
Week 5	الفصل الثاني الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق
Week 6	الجرائم النفسية ٢/١/١ . آليات الجرائم النفسية. ٢/١/٢ . آثار الجرائم النفسية. ٢/٢ . الجرائم الاجتماعية. ٢/٢/١ . عسكرة المجتمع
Week 7	موقف النظام البعثي من الدين انتهاكات القوانين العراقية ٢/٣/١ . صور انتهاكات حقوق الإنسان وجرائم السلطة
Week 8	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث ٢/٣/٣ . أماكن السجون والاحتجاز لنظام البعث
Week 9	الفصل الثالث الجرائم البيئية لنظام البعث في العراق.
Week 10	٣/١ . التلوث الحربي والإشعاعي وانفجار الألغام
Week 11	٢ . تدمير المدن والقرى) سياسة الأرض المحروقة
Week 12	تجفيف الأهوار ٣/٤ . تجريف بساتين النخيل والأشجار والمزروعات
Week 13	جرائم المقابر الجماعية
Week 14	جرائم المقابر الجماعية أحداث مقابر الإبادة الجماعية المرتكبة من النظام البعثي في العراق
Week 15	مراجعة
Week 16	امتحان نهائي

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	جرائم حزب البعث في العراق النسخة 1 – الطبعة الاولى 20023	yes
Recommended Texts	أرشفيف مؤسسة السجناء السياسيين. أرشفيف مؤسسة الشهداء. -أرشفيف المركز العراقي لتوثيق جرائم التطرف في العتبة العباسية المقدسة. -الموقع الرسمي للأمم المتحدة. -ايمن عبد العزيز سلامة ، ال مسؤولية الدولية عن ارتكاب جريمة الابادة الجماعية ، ط ١ ، دار العلوم للنشر والتوزيع ، القاهرة ، ٢٠٠٦ -جندي عبد الملك، الموسوعة الجنائية، الجزء الثالث، دار احياء التراث العربي، بيروت، ١٩٩٠ م.	No
Websites	https://iraqicenter-fdec.org/archives/4224	

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	Basic Physiology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 23015		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Dr. Mahdi Haider		e-mail
			Mahdi.h@kus.edu.iq
Module Leader's Acad. Title	Assist professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To acquaint the students with the components of the body cells and blood in order to prepare them for the practical life 2. To learning how the body organs work together and what the physiological aspect of it 3. To learning the students to perform some blood physiological markers tests 4. Training the students to check some human body vital signs and how to check the human body organs functions
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify what the meaning of physiology science and what the other sciences related with it 2. Identify how the body organs work and what the physiological function of it 3. Study the physiology of the hematopoiesis in human body 4. Study the cardiovascular system and its components 5. Identify how the Central nerve system work and its components 6. Stud the Endocrinology of human body 7. Study how the muscular system works and what the physiological function of its
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> Physiology science- the tools of physiology science, the branches of physiology science, the different between anatomy and physiology , blood components. [12 hrs] <u>Part B - Hematopoiesis</u> Blood - blood components, maturation of blood cells, function of blood and blood cells ,Hematocrit, the diseases related with hematocrit. [14 hrs] Revision problem classes. [6 hrs] <u>Part C Cardiovascular system</u> The components of cardiovascular system - the heart, Structure of the heart, How the heart work, the types of cardiac muscle cells, The Action potential role of cardiomyocyte , the blood vessels. [18 hrs] <u>Part D – Cells in Life</u> Neurons – Types of neurons, components of nerve system, the brain components ,

	The spinal nerve, Types of spinal nerves, the cranial nerve, the types of cranial nerves , the meninges and its layers.[12 hrs] <u>Part D – Muscular system</u> The types of muscles - the function of muscular systems , how the muscle works, the contraction and relaxation of muscles, the muscle tetanus and the disease related with muscle disorders.[10 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	5, 8	LO #1, 2, 10 and 11
	Assignments	1	5% (5)	6, 10	LO # 3, 4, 6 and 7
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	8	LO # 1-5
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – the Branches of physiology , the different between the physiology and anatomy
Week 2	The tools use in study the human body physiology and types of blood tests
Week 3	Blood components RBC , WBC, Platelet maturation
Week 4	The blood synthesis and maturations of blood cell
Week 5	The blood, functions, components, plasma, functions and serum.
Week 6	The hematocrit and the diseases related with it
Week 7	Introduction in Cardiovascular system
Week 8	The components of Cardiovascular system and its functions
Week 9	Blood red cells, shape, count, function, origin, the hemoglobin, constituents, normal value, function.
Week 10	Blood white cells, type, number, function, blood groups. Platelets, number, function, blood clotting, anti-coagulants, origin of blood clots.
Week 11	The cardiovascular system, the heart, structure, heart valves, the cardiac cycle, cardiac conductive system, factors affecting heart rate.
Week 12	The heart sounds and murmurs, blood supply to the heart, electrical properties of cardiac muscles E.C.G.
Week 13	The blood vessels, functional classification, structure of the vessels wall, the systemic circuit, pulmonary circuit, regulation of the blood vessels.
Week 14	The nervous system, the nerve cell and its function, the nerve impulse, the synapses, the nerves.
Week 15	The muscular system, types of muscles, characteristics of each type, The skeletal muscle, excitation, contraction coupling in the muscle fatigue, the muscle pain. The endocrine system, the hormone, chemistry, action, types of endocrine glands and their secretion.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Lab 1,2: Introduction to physiology lab
Week 3,4	Lab 3,4: Blood Draw
Week 5,6	Lab 5,6: ECG TEST

Week 7,8	Lab 7,8: EEG test
Week 9,10	Lab 9,10: Cardiac markers
Week 11,12	Lab 11,12: Troponin test
Week 13,14	Lab 13,14: CK-MB TEST
Week 15	Lab 15: Revision

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Human physiology , Berne & Levy Physiology 8th Edition 2019	Yes
Recommended Texts	BRS Physiology (Board Review Series) 7th Edition, 2018	No
Websites	https://www.coursera.org/browse/physiological-science	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biochemistry		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 23017		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Dr. Saad Hussein Khudhair	e-mail	Saad_2019@kus.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D
Module Tutor	Ass.Lec. Jwan Najm Abdullah	e-mail	Jwan.Najm@kus.edu.iq
Peer Reviewer Name	Dr.Mustafa Abdul Hussein Abdul Ameer	e-mail	Mustafa.a@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Give a general introduction to the basic concepts of biochemistry. 2- Give an understanding of the functions of carbohydrates, proteins, lipids, and nucleic acids. 3- Explain the structure, properties, and roles of lipids in biological systems. 4- The module also gives insight into the importance of biomolecules. 5- Through problem sets, exams, and quizzes in this module the students will demonstrate the ability to engage in scientific as well as quantitative and qualitative reasoning. 6- Students will also demonstrate the ability to communicate science in writing. 7- Complete the reports, seminars, and presentations to develop the student's skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Ability to apply the fundamental knowledge of Biomolecules and their techniques in the area of biochemistry. 2- Ability to conduct experiments, and analyze and interpret the results. 3- Ability to identify, formulate and solve problems in the area of biochemistry. 4- A knowledge of contemporary issues in the biochemistry area and their applications. 5- An ability to use the techniques, skills, and modern professional tools necessary for professional practice and research in the biochemistry field. 6- An ability to apply the relevant knowledge and scientific skills to manage a research project in the biochemistry field.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A – Biochemistry and Life</u> Scope of biochemistry- The foundations of biochemistry, Cellular and chemical foundations of Life, Cells types, characteristics of living things, Water as a biological solvent, pH, buffers, Biological Buffers. [5 hrs] <u>Part B – Carbohydrates and Life</u> Families of Carbohydrates- monosaccharides- Types of monoses, Chemical and physical properties, Biological functions, Sugar derivatives. Disaccharides- the concept of reducing and non-reducing sugars, Properties, and functions of maltose, lactose, and sucrose. Polysaccharides- Types of polysaccharides (storage polysaccharides, Structural Polysaccharides, Homopolysaccharides, and heteropolysaccharides), Properties, and functions of polysaccharides. [13 hrs] <u>Part C – Amino acids</u> Monomers of proteins- The building blocks of proteins, the General formula of amino acids, Classification and biochemical structure of standard amino acids, Properties and functions of amino acids, and Reactions of amino acids. [14 hrs] Revision problem classes. [3 hrs] <u>Follows Part C – Peptides and proteins</u> Peptide bond: Definition and structure of peptide bond, biologically important of peptides and their functions, Chemical and physical properties of peptides, Numbering and naming the peptides. Oligopeptides: Structure, functions, and their characteristics.

	Proteins: Definition, structural levels of proteins (primary, secondary, tertiary, and quaternary structure), Classification of proteins, Functions, and occurrence in biological systems, Chemical, and physical properties. [10 hrs] <u>Part D – Nucleic acids</u> Nature of genetic material, Chemistry of purine and pyrimidine, Nucleosides properties, Nucleotides properties, Structure and properties of DNA; Types of DNA & RNA, Structure and functions of mRNA, tRNA, rRNA. [10 hrs] <u>Part E – Lipids</u> Fatty acids - Building blocks of lipids, Definition and major classes, Fatty acids structure, and functions. Types of fatty acids, Physical and chemical properties Lipids - Introduction, definition, classification, and functions of Lipids, simple lipids, compound lipids, and derived lipids, Reactions, and properties of lipids. [10 hrs] <u>Part F – Enzymes</u> Enzymes – Definition and Structure of enzyme, Classification of enzymes, Mechanism of action of enzymes (active site, binding site, and substrate), Functions of enzymes, Effect of pH, temperature, time, and other factors on enzyme activity. [7 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Many techniques and explanation methods will be used in this module to increase students' ability to learn in the biochemistry course by encouraging students' participation in exercises, seminars, laboratory experiments, and workshops, in addition to using non-traditional learning methods such as the use of educational videos and electronic simulation equipment to improve scientific and critical thinking skills are expanded. This will be achieved through the use of the foregoing during the theoretical and practical educational classes, using simple and interesting methods that include types of simple experiments for students.

Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem)	78	Structured SWL (h/w)	5.2
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	72	Unstructured SWL (h/w)	4.8
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	150		
الحمل الدراسي الكلي للطالب خلال الفصل			
Module Evaluation			
تقييم المادة الدراسية			

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	6, 9	LO from 1-9
	Assignments	2	5% (10)	5, 10	LO from 1-12
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	2	5% (10)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO from 1-6
	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 the biochemistry
Week 2	Introduction to the carbohydrates
Week 3	The types, structure, and functions of monosaccharides
Week 4	The Oligosaccharides and polysaccharides
Week 5	The amino acids I
Week 6	The amino acids II
Week 7	Mid-term Exam
Week 8	The peptides and proteins I
Week 9	The peptides and proteins II
Week 10	The nucleic acids I
Week 11	The nucleic acids I
Week 12	The lipids I
Week 13	The lipids II
Week 14	The enzymes I
Week 15	The enzymes II
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction in Laboratory Safety & Good Practices
Week 2	Lab 2: Colorimetric Analysis Techniques & Uses of Spectrophotometer in the Biomolecule Analysis
Week 3	Lab 3: Preparation and Use Buffer Solution (Molar and Normal solutions)
Week 4	Lab 4: Qualitative and Quantitative Analysis in the Biomolecule Analysis
Week 5	Lab 5: Introduction in the Qualitative Analysis of Carbohydrates
Week 6	Lab 6: Detection of Glucose by Molisch's Reagent
Week 7	Mid-term Exam
Week 8	Lab 8: : Introduction in the Quantitative Analysis of Carbohydrates
Week 9	Lab 9: : Estimation of Starch by Atherone Reagent
Week 10	Lab 10: Quantitative Analysis of Lipid
Week 11	Lab 11: Solubility and Emulsion Tests of Oils
Week 12	Lab 12: Qualitative and Quantitative Analysis of Total Proteins & Amino Acids
Week 13	Lab 13: Qualitative and Quantitative Analysis of Albumin , Proline & Leucine by Ninhydrin Reagent
Week 14	Lab 14: Quantitative Analysis of Nucleic Acid in Plasma by Spectrophotometer
Week 15	A preparatory week before the final exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lehninger: Principles of Biochemistry (2013) 6th ed., Nelson, D.L. and Cox, M.M., W.H. Freeman and Company (New York).	No
Recommended Texts	Biomaterials: Bhat, Sujata, V., Narosa Publishing House, 2010.	No
Websites	https://scholar.google.com/	

Grading Scheme

مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Cell Biology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 23013		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Asmaa Sami Ibrahim		e-mail: asmaasami@kus.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification: Ph.D.
Module Tutor	-----		e-mail: -----
Peer Reviewer Name	Dr.Mustafa Abdul Hussein Abdul Ameer		e-mail: Mustafa.a@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To give the student a general view of cell biology, structures and purposes of basic components of prokaryotic and eukaryotic cells especially macromolecules, membranes and organelles. 2. To understand how these cellular components are used to generate and utilize energy in cells. 3. To understand how cells contribute to the overall functioning of the organism and how malfunctions at the subcellular level lead to disease such as cancer. 4. To understand information about the analysis of the structure and functions of genes and the regulation of the synthesis of enzymes and proteins, as well as the mechanism of cellular differentiation, through the study of cell biology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic concepts of cell biology. 2. Describe the relationship between the basic concepts of cell life in general. 3. Identify the cell, its types, structure, functions and the structure of its organelles. 4. Analyzing and identifying the importance of cell biology and its relationship to various organisms, including humans. 5. Understanding and comprehending the principles of cell biology, represented by the fact that all creatures consist of cells, the basis of their development in animals and plants, and their role in all aspects of life such as growth, movement, reproduction, adaptation, etc. are studied.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - The cell, types and characteristics</u> Introduction of the cell and its differentiation, comparison study between Prokaryotes and Eukaryotes cells. The plasma membrane, characteristics, Cell junctions types and extracellular matrix [17 hrs] <u>Part B – The biological processes of the cell</u> Cell Transport (Types and differences) ,Cell life cycle, stages and controlling mechanisms and enzymes . Cell respiration types and the mechanisms of energy conversion through cellular respiration in the body. Mechanisms and types of cellular communication. [16 hrs] Revision problem classes [6 hrs]

	<u>Part C–Cell genetic characteristics</u> Cell's DNA and Chromosomes , replication , transcription and translation. Mechanisms of transforming a normal cell into a cancerous cell. [15 hrs]
	<u>Part D – Cancer cell</u> A comparative study between a normal cell and a cancer cell, types of cancerous tumors, characteristics of their cells, causes and methods of treatment. [12 hrs]
	Review before the final exam[6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is: -Theoretical lectures and conducting practical experiments to understand and comprehend the vital processes that take place inside the prokaryotic cells (bacteria) and eukaryotic cells (plants, animals) and the differences between them in terms of their contents as organelles, their characteristics and their various vital activities. - Define student groups to discuss various topics related to Cell Biology by setting electronic hours for discussion. - Presentation of a seminar by each student at the end of the semester within one of the topics related to the Cell Biology Course.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of the cell
Week 2	Prokaryotes
Week 3	Eukaryotes
Week 4	The cell membrane
Week 5	Types of Cell Transport
Week 6	Cell junctions and extracellular matrix
Week 7	Mid-term Exam
Week 8	The Cell Cycle
Week 9	Cancer cell
Week 10	DNA and Chromosomes
Week 11	DNA replication and proteins synthesis
Week 12	Cell respiration
Week 13	Cell signaling
Week 14	Cell death 1
Week 15	Cell death 2
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: The cell and cell differentiation.
Week 2	Lab 2: Preparation of temporary slides.
Week 3	Lab 3: Preparation of permanent slides.
Week 4	Lab 4: The plasma membrane.
Week 5	Lab 5: Microscope measurement.
Week 6	Lab 6: Cell fractionation.
Week 7	Mid Exam
Week 8	Lab 7: The cell coats and chloroplast.
Week 9	Lab 8: Types of Chromosomes and Special chromosomes.
Week 10	Lab 9: Normal cells and Cancer cells.
Week 11	Lab 10: Mitochondria (Shape, size, structure and functions).
Week 12	Lab 11: Lysosomes.
Week 13	Lab 12: Peroxisomes.
Week 14	Lab 13: Cell culture techniques.
Week 15	Revision
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	CELL BIOLOGY (Second edition) by Stephen R. Bolsover , Jeremy S. Hyams , Elizabeth A. Shephard , Hugh A. White & Claudia G. Wiedemann (2003)	No
Recommended Texts	Molecular Cell Biology (Fifth Edition) by Harvey Lodish , Arnold Berk , Paul Matsudaira , Chris A. Kaiser , Monty Krieger , Matthew P. Scott , Lawrence Zipursky & James Darnell (2003)	No
Websites	https://www.ascb.org/ https://rupress.org/jcb	

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	Applications of computer science		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	KUS 24022			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level		Semester of Delivery		2
Administering Department	MBO	College	SCI	
Module Leader	Mustafa Ayad Anwer		e-mail	Mustafa.alani@kus.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.Sc.
Module Tutor	Lec. Mustafa Ayad Anwer		e-mail	Mustafa.alani@kus.edu.iq
Peer Reviewer Name	Dr.Saad Hussein Khudhair		e-mail	Saad2019@kus.edu.iq
Scientific Committee Approval Date	9/1/2025	Version Number	ق/أ.م/ 508	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Security and Networking: • To introduce students to computer networks, their components, and basic security principles. • To prepare students for managing and mitigating network threats. 2. Computer Troubleshooting: • To equip learners with the ability to diagnose and resolve common hardware and software issues. 3. E-Commerce: • To familiarize learners with electronic banking services, including online and mobile banking. 4. Introduction to AI: • To provide an overview of artificial intelligence and its applications in everyday life. • To introduce key ethical considerations, societal impacts, and future developments in AI.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Security and Networks: • Describe different types of networks and their components. • Implement basic security measures to protect network integrity. 2. Computer Troubleshooting: • Apply diagnostic tools to identify hardware/software problems. • Use practical methods to resolve technical issues. 3. E-Commerce: • Utilize electronic banking services for transactions. • Explain the mechanisms behind online banking and security. 4. Artificial Intelligence: • Identify applications of AI in daily life, such as smartphones and healthcare. • Discuss the ethical and societal challenges posed by AI technologies. • Predict future trends and innovations in AI.
Indicative Contents المحتويات الإرشادية	1. Network security principles: (4 hrs) • Understanding threats such as malware, phishing, and hacking.

	• Fundamentals of networking and its components.
	2. E-Commerce: (2 hrs) • Fundamentals of online banking: • Online and mobile banking. • Debit and credit card services. • Use of electronic alerts for secure banking.
	2. Computer Troubleshooting: (4 hrs) • Identifying common hardware and software problems: Troubleshooting hardware issues (e.g., printers, keyboards, connectivity). • Resolving software conflicts (e.g., operating system errors, application crashes). • Diagnostic tools: Usage of built-in system tools for troubleshooting (e.g., Task Manager, disk utilities). • Introduction to third-party diagnostic software.
	3. Introduction to Artificial Intelligence (AI): (4 hrs) • AI in Daily Life: Applications of AI in smartphones, virtual assistants (e.g., Siri, Google Assistant).
	4. The Role of AI in Modern Smartphones: (4 hrs) • How AI is utilized in Modern Smartphones.
	5. Applications and Tools of AI: (3 hrs) • AI applications. • AI tools.
	6. AI and Society: (2 hrs) • How AI affects the social life. • AI and the future of humanity.
	7. Ethical Challenges in AI: (2 hrs) • Issues of privacy, surveillance, and the job market.
	8. Future of AI: (2 hrs) • Trends, recent research, and emerging technologies.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Deliver theoretical content through structured lectures.
2. Use multimedia aids (e.g., presentations, videos) to enhance understanding of abstract topics like AI and networking.
3. Hands-on practice for email setup, document collaboration, and troubleshooting.
4. Lab-based exercises to simulate network setups and resolve network issues.
5. Demonstrations of e-commerce tools, such as secure online banking and mobile payment systems.
6. Collaborative problem-solving for troubleshooting real-life IT issues.
7. Group discussions on AI's impact on society and ethical challenges.
8. Present real-world scenarios of AI applications in healthcare, finance, and transportation.
9. Analyze security breaches and propose preventive measures for network security.
10. Assign projects such as:
 - Designing secure email workflows.
 - Developing troubleshooting guides for common computer issues.
 - Proposing solutions for AI-related societal challenges.
11. Assign readings from textbooks and reference materials for self-study.
12. Encourage the use of online tutorials and open-source tools for further exploration.
13. Formative Assessment:
 - In-class quizzes and practical evaluations.
 - Group presentations on assigned topics.
14. Summative Assessment:
 - Final theoretical exams to assess understanding.
 - Practical tests to evaluate troubleshooting and application skills.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	5% (15)	3,5,10	LO#1,2,10 and 11
	Assignments	1	5% (5)	12	LO#3,4,6 and 7
	Projects / Lab.	1	10% (10)	15	LO # 4,14
	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 الأسبوعي النظري	
	Material Covered
Week 1	Introduction to Networking, Overview of networks and types of networks.
Week 2	Network Security Basics, understanding network threats.
Week 3	Introduction to E-Commerce and Online Banking, Concepts of electronic banking, online banking basics
Week 4	Computer Troubleshooting: Identifying software and hardware issues and solving them.
Week 5	Basic Troubleshooting Techniques, Tools and techniques for diagnosing issues.
Week 6	Introduction to Artificial Intelligence, Definition, history, and overview of AI.
Week 7	Key Characteristics of AI, benefits of AI, Challenges and ethical considerations.
Week 8	The role of AI in modern smartphones, virtual assistants.

Week 9	Adaptive learning, Real-Time Translation Services.
Week 10	Applications of AI, AI in education, healthcare, finance, and marketing
Week 11	Further Applications of AI, AI in transportation and advertising
Week 12	Applications of AI: Finance, Robotics and Automation Technologies.
Week 13	AI and Society, AI's impact on social and international relations
Week 14	Ethical Challenges in AI, Ethical concerns, privacy, and AI's impact on jobs
Week 15	The Future of AI, Future trends, research, and emerging technologies
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Weeks 1-2	
Week 3	
Weeks 4-5	
Weeks 6-7	
Weeks 8-9	
Weeks 10-11-12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Graham Brown, David Watson, "Cambridge IGCSE Information and Communication Technology," 3rd Edition (2020). 2. Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete," 16th Edition (2020).	no

	3. Ahmed Banafa, "Introduction to Artificial Intelligence (AI)," 1st Edition (2024).	
Recommended Texts	1. الخضر علي الخضر بحات, " أساسيات الحاسوب " , 2016. 2. الدكتور عادل عبدالنور, "مدخل إلى عالم الذكاء الاصطناعي", 2005.	no
Websites	• https://www.mathworks.com/ • https://www.wix.com/blog/ecommerce/2023/12/ai-in-ecommerce • https://boostcommerce.net/resources/ai-ecommerce	

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	Bacteriology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 24024		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Taif Hussain Hassan		e-mail
		mustafa.suhel@kus.edu.iq	
Module Leader's Acad. Title	Doctorate lecture	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	Saad_2019@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م/ 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	----	Semester	----
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Describe the key experiments that disproved spontaneous generation. 2. Compare between prokaryotic and eukaryotic cells. 3. Enumerate phases of bacterial growth. 4. Distinguish between autotrophic and chemotrophic bacteria. 5. List the three central metabolic pathways. 6. Explain why it is important that a bacterial cell be able to regulate the expression of certain genes. 7. Interpret the genetic changes that can alter the properties of bacteria. 8. Describe how prokaryotes are classified. 9. Describe the first line defenses employed by a host against pathogenic bacteria. 10. Compare between bacteriostatic and bactericidal effect of antibiotics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge the general characteristics of bacteria and how they name and classify them. 2. Training the laboratory skills in collecting, culturing, isolating, and diagnosing the bacterial samples and how are laboratory materials and equipment used. 3. Introducing the student to the types of bacterial nutrition and main metabolic pathways. 4. Understanding the effects of chemical and physical factors on growth of risk bacterial strains. 5. Realizing the importance of antibiotics, their mechanisms of action, and side effects. 6. Contrasting the characteristics of bacterial DNA and RNA and methods of genetic transfer between bacteria in nature. 7. Comprehending the role of biological, physical, and chemical barriers in defense against pathogenic bacteria. 8. Applying the advanced techniques in detection of bacteria isolated from infected sites. 9. Contributing to spread the culture of health awareness and how can aid people to handling with bacterial infections in society. 10. Understanding the consequences of excessive use of antimicrobial therapy in emergence of multidrug resistant strains that implicated in serious infections worldwide.
Indicative Contents المحتويات الإرشادية	1. Fundamentals of Bacteriology [6 hrs.] The origin of microorganisms- Theory of Spontaneous- Scope of Bacteriology 2. Structure of Bacterial Cell [5 hrs.] Cell wall- Plasma membrane- Cytoplasm- Nucleus- Other organelles 3. Bacterial Taxonomy [4 hrs.] Criteria for classifying bacteria- Significance of Bergeys manual- Bacterial nomenclature 4. Bacterial Growth [8 hrs.] Cell division- Phases of growth- Measuring bacterial growth- Factors affecting bacterial growth- Sporulation- Culturing bacteria

	5. Bacterial Nutrition [3 hrs.] Photoautotrophy- Photoheterotrophy- Chemoautotrophy 6. Bacterial Metabolism [9 hrs.] Properties of enzymes- Inhibition of enzymes- Glycolysis- Fermentation- Respiration- Metabolism of protein- Metabolism of fat 7. Sterilization and Disinfection [7 hrs.] Principles of sterilization and disinfection- Chemical antibacterial agents- Physical antibacterial agents 8. Antimicrobial Therapy [8 hrs.] History of antimicrobial therapy- Properties of antimicrobial therapy- Methods of sensitivity determination- Classes of antibacterial agents 9. Diagnosis and Identification of Bacteria [10 hrs.] Common methods used in the diagnosis bacteria which include direct examination using a microscope, sample culture, tests that detect genetic material in bacteria, and antibiotic susceptibility testing 10. Bacterial Genetics [9 hrs.] Change in phenotype (modification)- Structure of DNA- Structure of chromosome- Genetic codon- DNA replication- DNA Transcription- DNA translation- Mutations 11. Pathogenicity [7 hrs.] Normal flora- Transmission- Adherence- Invasion- Inflammation- Toxin production 12. Host Defense [6 hrs.] Innate immunity- Adaptive immunity- Failure of host defense 13. Bacterial Vaccines [5 hrs.] Active immunity- Passive immunity
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The principle aim of providing students with the module of general bacteriology is to aid them for contributing, initiating, and enabling them to develop their learning skills, level of thinking, and method of processing and understanding the information provided by this unit. Consequently, this can be achieved through class lectures when interactive programs through skillful communication were applied. Moreover, the practice of basic experiments in the bacteriological field that include collecting, examining, and diagnosing samples from different sources which are of interest to the students will be also performed.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	5% (5)	8	LO #1, 2, 3,5,6 and 7
	Assignments	2	5% (10)	5, 10	LO #2, 4, 6 ,8 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Fundamentals of Bacteriology
Week 2	Structure of Bacterial Cell
Week 3	Bacterial Taxonomy
Week 4	Bacterial Growth
Week 5	Bacterial Nutrition
Week 6	Bacterial Metabolism
Week 7	Mid-Term Exam
Week 8	Bacterial Metabolism
Week 9	Sterilization and Disinfection
Week 10	Antimicrobial Therapy

Week 11	Bacterial Genetics
Week 12	Pathogenicity
Week 13	Host Defense
Week 14	Bacterial Vaccines
Week 15	Preparatory week before the final exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Culture media
Week 2	Bacterial isolation
Week 3	Bacterial growth in broth and anaerobic growth
Week 4	Morphology of bacterial colonies
Week 5	Bacterial staining
Week 6	Bacterial staining
Week 7	Mid-Term Exam
Week 8	Counting of bacterial colonies
Week 9	Control of bacterial growth
Week 10	Bacterial motility
Week 11	Biochemical tests
Week 12	Biochemical tests
Week 13	Antibiotic sensitivity tests
Week 14	Biofilm screening
Week 15	Preparatory week before the final exam
Week 16	Final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	-Black, J.G. and Black, L. J. (2015). <i>Microbiology : principles and explorations</i> , 9th ed. Hoboken, NJ: Wiley, USA. 940pp.	No
Recommended Texts	- Willey, J.M., Sandman, K.M. and Wood, D.H. (2023). <i>Prescott's Microbiology</i> , 12th ed. McGraw-Hill Education, USA. 911pp. -Mahon, C.R. and Lehman, D.C. (2023). <i>Textbook of Diagnostic Microbiology</i> , 17th ed. Elsevier, India. 1105pp.	No
Websites	https://www.wiley.com/en-us/Microbiology%3A+Principles+and+Explorations%2C+10th+Edition-p-9781119390152 https://www.mheducation.com/highered/product/prescott-s-microbiology-willey-sandman/M9781264088393.html https://evolve.elsevier.com/cs/product/9780323681056?role=student	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Histology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 24019		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	2
Administering Department	MBIO	College	SC
Module Leader	Dr. Genan Adnan Abdullatef Al-Bairuty	e-mail	galbairuty@gmail.com or galbairuty@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Saad Hussein Khudhair	e-mail	Saad2019@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Histology is considered as one of the fundamental disciplines in the medical curriculum for both humans and animals. This field serves as the cornerstone for other sciences including anatomy, animal and human physiology, histology, immunohistochemistry, and others. This module aims to: 1. Understand the principal types of tissues in the human body. 2. Understand how each type is classified. 3. Recognize the characteristic of each type of tissue. 4. Recognize the general function of each type.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student's understanding of basic histology principles. 2. The student should be able to identify the different types of tissues and their characteristics. 3. The student's ability to examine histological slides by using the microscope. 4. Preparing cadres with the necessary training and skills to work in healthcare institutions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Epithelial tissue and Glandular tissue</u> Definition of epithelial tissue, Types of epithelial tissue, Characteristic of each type of epithelial tissue, classification of epithelial tissue, the main function of each type. Definition of glandular tissue, glandular tissue types, characteristic of each type glandular tissue, classification of glandular epithelium [15 hrs] <u>Part B –Connective tissue</u> General characteristic of connective tissue, cells of connective tissue, fibers of connective tissue, ground substance of connective tissue, classification of the connective tissue. [9 hrs] Revision problem classes. [5 hrs] <u>Part C – Specialized connective tissue (cartilage and bones)</u> Cartilages definition, cells, fibers, ground substance, Types; Bone definition, bone matrix, bone cells, anatomical classification of bone, histological classification of bone [12 hrs] <u>Part D – Blood and hematopoiesis steps</u>

	Major components and functions of blood, erythrocytes, leukocytes types, blood platelets, bone marrow, hematopoiesis. [9 hrs] <u>Part E – Muscular tissue</u> General characteristic of muscle tissue, classification of muscle tissue, characteristic of skeletal muscle fibers, structure of skeletal muscle, characteristic of smooth muscle, characteristic of cardiac muscle [15 hrs] <u>Part F – Nervous tissue</u> General information about the nervous tissue, structure of a neuron, classification of neurons, types of neurons, neuroglia, synapse, nerve fibers, peripheral nervous system, central nervous system (cerebellum and spinal cord) [15 hrs] Review before the final exam [7 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module will employ a variety of strategies to enable students to learn and enhance their abilities in histology, including participation in lab experiments, seminars, and workshops, as well as the use of educational films to sharpen and broaden their knowledge of critical thinking. This will be accomplished through courses, interactive tutorials, and the examination of tissue section slides.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	5% (5)	9	LO #1, 2,3, 5, 6, 7, and 8
	Assignments	2	5% (10)	5, 10	LO # 3, 4, 6 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	12	LO # 11
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Definition of histology, main types of tissue, classification of epithelial tissue, types of simple epithelium and pseudostratified epithelium, characters of each type.
Week 2	Classification of stratified epithelium and the main character of each type
Week 3	Glandular epithelium, classification of glandular epithelium
Week 4	Connective tissue, cells types of connective tissue,
Week 5	Fibers of Connective tissue and ground substance of connective tissue
Week 6	Classification of connective tissue, characteristic of each type
Week 7	Mid-term Exam
Week 8	Specialized connective tissue (Cartilage), cells, fibers and matrix of cartilage, types of cartilage
Week 9	Specialized connective tissue (Bone), bone cells, anatomical classification of bone, histological classification of bone
Week 10	Specialized connective tissue (blood), major components and functions of blood, erythrocytes and types of Leukocytes.
Week 11	Bone marrow and hematopoiesis
Week 12	Muscle tissue, characteristic of muscle tissue, classification of muscle tissue, characteristic of each type.

Week 13	Nervous tissue, structure of neuron, classification of neuron, types of neurons
Week 14	Neuroglia and neuroglial types, Synapse and synapses classification
Week 15	Nerve fibers, peripheral and central nervous system
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab1: Laboratory guidelines and parts identification for compound microscopes.
Week 2	Lab 2: Slides to show the types of simple epithelial tissue and pseudostratified epithelial tissues.
Week 3	Lab 3: Slides to show the types of stratified epithelium.
Week 4	Lab 4: Slides to show the types of glandular epithelium
Week 5	Lab 5: slides to show connective tissue cells and fibers.
Week 6	Lab 6: slides to show the types of connective tissue.
Week 7	Mid Exam
Week 8	Lab 7: Slide to show cartilage cells and fibers
Week 9	Lab 8: Slide to show types of cartilage
Week 10	Lab 9: Slide to show the types of bone
Week 11	Lab 10: Blood smear to show blood components
Week 12	Lab 11: Slides to show nerve cells structure, nerve fiber, and nissl bodies
Week 13	Lab 12: Slide to show the structure of cerebellum
Week 14	Lab 13: Slide to show the structure of spinal cord
Week 15	Revision
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Junqueira, L.C. and Carneiro, L. (2018). Basic histology, 15th ed., NoMcGraw Hill/Medical P. 576.	No
Recommended Texts	Victor, P. E. (2008). diFIORE'S ATLAS OF HISTOLOGY WITH FUNCTIONAL CORRELATIONS, 11th ed. Lippincott Williams & Wilkins	No
Websites	https://drive.google.com/file/d/1uAiOFbM1OoO9P7k_CYHJpljPzadnXlGf/view Wikipedia , YouTube , Google search	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Mycology		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 23014		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Dr. Duha Bahaa Mohammed		e-mail duha81@kus.edu.iq
Module Leader's Acad. Title	Assist.Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1.Study types of fungi and their characteristics, nutrition, and classifications 2.To investigate other new types in human and environment samples and classified. 3.Help students to develop skills to identify different types of fungi by coloring, their shape, and culturing. 4- Providing students with communication skills with each other using the teamwork method within the classroom or extra-curricular activities.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completing this course, students will understand the following 1. Isolation, screening of fungi from different environments 2. Culturing fungi in different ways. 3. Classify pathogenic fungi which infect human 4. The relationship between fungi and other microorganisms 5. The uses of fungal isolates in bioremediation and other techniques.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A –Fungi and their characteristics</u> Fungi, Characteristics of Fungi, classification system,morphology of fungi,how fungi differ from bacteria,reproduction,living mode of fungi. [10 hrs.] <u>Part B cultivation of fungi</u> Important element of fungal growth,environmental condision for fungal cultivation,reproduction in fungi,importance of fungi,harmful of fungi. [10 hrs.] <u>Part c classification of fungi</u> Division #myxomycota, plasmodiophoromycota,life cycle of myxomycota,ceratiomxomycota, [10 hrs.] Revision problem classes [4 hrs.] <u>Part D – Myxogastomycota</u> Myxogastomycetes,life cycle myxogastomycetes,life cycl plasmodiophoromycetes Myxogastomycetidae,lichiales,stemonitales,physarales [8 hrs.] <u>Part E – Eumycota</u> Chytridiomycota,mastigomycota,chytridiales,blastocladales,life cycle of synchtrium endobioticum, [10 hrs.] <u>Part F– Eumycota</u> Oomycota,pythiaceae,perenosporaceae,albugoginaceae,life cycle albugo candida[5 hrs.]

	Part G– Eumycota Zygomycotina, zoopagales, entomophthorales, <u>mucorales</u> , chanephora trispora, Thamnidium, kicksellia, life cycle plasmodiophora brassica, life cycle Rhizopus stolonifer [5 hrs.]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Many strategies will be used in this module to develop learning and open pupils mind to discover pathogenic fungi surround us and infect human body by using different technique in cultivation and participation in the exercises, seminars, lab experiments, and workshops related to the field of isolation, purification, and diagnosis of fungi, as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, interactive tutorials, and simple laboratory experiments that involve some activities of sampling, examining, and isolating its microbial community in ways that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	5% (5)	4	LO #1, 2, 3,4,5,6 and 7
	Assignments	1	5% (5)	5	LO # 2, 4, 6 , 8 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	10% (10)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Fungi defention,characteristic,classification,nutrision
Week 2	Cultivation,reproduction,living mode of fungi,useful of fungi,harmful effect of fungi
Week 3	Classification of fungi,myxomycota,myxomycetes,plasmodiophoromycetes,life cycle myxomycetes
Week 4	Mastigomycotina,chytridiomycetes,chtidiales,blastocladales,life cycle Allomyces
Week 5	Oomycota,hypochtridiomycetes,saprolegniales,perenosporales,life cycle Saprolegnia
Week 6	Zygomycota,zoopagales,entomophthorales,mucorales,life cycle Rhizopus
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Ascomycota,hemiascomycetes,plectomycets,pyrenomycetes,discomycetes,loculoascomycetes
Week 9	Urotiales,saccharomycetales,taphrinales,Aspergillus life cycle
Week 10	Epigean,hypogean,erisyphales,hypocreales,life cycle sclerotinia fructicola
Week 11	Morchellaceae,pizezaceae,tuberaceae,life cycle venturia enaqualis
Week 12	Basidiomycota,basidium structure,teliomycetes,rust fungi,smut fungi
Week 13	Life cycle Puccinia graminis,ustilagonales,amanita muscaria
Week 14	Agaricales,pore fungi,coral fungi,shelf fungi,polyporaceae
Week 15	Deuteromycota,hyphomycetyes,monilliacae,rhizoctonia,Septoria apii
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1, 2	Lab 1, 2: : Fungi culturing and isolation
Week 3, 4	Lab 3, 4: fungi isolation from air then cultivate
Week 5, 6	Lab 5, 6: fungi isolation from water then cultivate
Week 7, 8	Lab 7, 8: fungi isolate from polluted soil then cultivate
Week 9, 10	Lab 9, 10: fungi staining
Week 11, 12	Lab 11, 12: fungi identification
Week 13, 14	Lab 13, 14: fungi purification
Week 15	Lab 15: Revision

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Medical mycology, secret life of fungi manual Published: September 21, 2022	No
Recommended Texts	Food borne fungi macroscopic and microscopic features 1986	No
Websites	https://funguseducationhub.org/?gclid=EAlalQobChMlpMzMvmcfK_wIV1RsGAB2GVQMgEAAAYASAAEgJtgfD_BwE .	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: 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 Parasitology		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 24025		
ECTS Credits	5		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Dr. Sally Ahmed Thyiab.		e-mail: Sally.almola@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----		e-mail: -----
Peer Reviewer Name	Dr.Saad Hussein Khudhair	e-mail	Saad2019@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Give a general understanding of the types, divisions, and components of Parasites. 2. Understand the effect of Parasites on humans and their environments. 3. Gain practical knowledge of the classification of Parasites 4. Complete the reports, seminars, and presentations to develop the student's skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the most important General characteristics of Parasites 2. Learn about methods of isolating and diagnosing parasites 3. Recognize and examine their shapes 4. Knowledge of parasite life cycles and treatment methods
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A - Introduction</u> Define of Parasitology, Terms of parasitology, Types of parasite . Types of hosts Classification of parasites , Pathogenesis and symptomatology, Diagnosis, Epidemiology, Control & Prevention [8 hrs.] <u>Part B - protozoa</u> Intestinal protozoa, <i>Entamoeba histolytica</i>, <i>Entamoeba coli</i>, <i>Endolimax nana</i>, <i>Iodamoeba buetschlii</i>, <i>Entamoeba gingivalis</i>, <i>Dientamoeba fragilis</i>.life cycles, Pathogenesis , Diagnosis, Epidemiology The flagellate of digestive tract & urogenital systems, <i>Giardia lamblia</i>, Genus <i>Trichomonas</i> .[10 hrs.] Revision problem classes. [6 hrs.] <u>Part C - Haemoflagellate</u> The Flagellate of blood (Haemoflagellate), <i>Leishmania</i> and <i>Trypanosoma</i> <i>Leishmania tropica</i>, . <i>Leishmania donovani</i>, <i>Leishmania braziliensis</i> <i>Trypanosoma brucei</i>, <i>Trypanosoma gambiense</i>, <i>Trypanosoma cruzi</i>[12 hrs.] <u>Part D – Ciliophora</u> <i>Balantidium coli</i>, Morphology, Life cycle, Pathogenesis and Symptoms, Diagnosis, Epidemiology, Prevention and control. [10 hrs.] <u>Part E –Haemosporidia</u> Genus: <i>Plasmodium</i> <i>Plasmodium vivax</i> , <i>Plasmodium ovale</i> , <i>Plasmodium falciparum</i>, <i>Plasmodium malariae</i> Genus <i>Toxoplasma</i> <i>Toxoplasma gondii</i>. [16 hrs.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Many strategies will be used in this module to encourage students to learn such as participation in the exercises, seminars, lab examinations, and workshops, as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple Microscopic examinations for samples.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	5% (5)	8	LO #1, 2, 3, 5,6, and 7
	Assignments	2	5% (10)	5, 10	LO # 2, 4, 6, 8, and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
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Week 1	Introduction
Week 2	Define of Parasitology, Terms of parasitology
Week 3	protozoa
Week 4	Intestinal protozoa
Week 5	The flagellate of digestive tract
Week 6	The flagellate of urogenital systems
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Flagellate
Week 9	Haemoflagellate
Week 10	Leishmania
Week 11	Trypanosoma
Week 12	Ciliophora
Week 13	Haemosporidia
Week 14	Genus: <i>Plasmodium</i>
Week 15	Genus Toxoplasma
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1+2	Lab 1+2: Introduction of Parasitology
Week 3+4	Lab 3+4: protozoa
Week 5+6	Lab 5+6: The flagellate of digestive tract
Week 7+8	Lab 7+8: The flagellate of urogenital systems
Week 9+10	Lab 9+10: Haemoflagellate
Week 11+12	Lab 11+12: Ciliophora
Week 13+14	Lab 13+14: Haemosporidia
Week 15	Mid-Term Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Foundation of Parasitology by Roperts,L.S. and Janovy,Jr.J. 8 th ed.2009.the Mc Graw_Hill companies.Newyork.USA.	No
Recommended Texts	Paniker's Textbook of Medical Parasitology by Paniker ,Ck.J. and Ghosh,S.8 th ed.2018 The Health Sicens Puplisher.New Delhi.India	No
Websites	https://www.coursera.org/browse/biology-science	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	General Virology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 24023		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Ali Abdulkareem		e-mail
			ali.ali@kus.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Mustafa Abdul Hussein Abdul Ameer	e-mail	Mustafa.a@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. The course aims to provide a basic knowledge about viruses, their structure, life cycle, diseases that they cause and treatment of these diseases. 2. To understand the structure of viruses, and their components. 3. To understand the classification of viruses. 4. To clarify how the virus infect and multiply inside host cell by explaining the life cycle of viruses that infect animals, plants, and bacteria. 5. To clarify how the viral nucleic acid is replicated by explaining in details how the DNA (single or double stranded), RNA (single or double stranded, positive or negative sense single stranded), is replicated. 6. To know the available medications for viral infections, know the potential targets for developing new treatment, and the hurdles that limit the invention of new medication, and the prevention of viral infections.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of this course, students should have the basic understanding and knowledge on all the aspects of Virology and comprehended the structure of viruses, the viral like particles, the interactions between virus and host cell, various strategies of viral replication, the treatment and prevention of viral infection and how to develop vaccines and new medications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Section 1 – Introduction to Virology. [10hrs.]</u> - Virus structure and classification. - Genome types, capsid symmetry, envelope. With examples. - Virus-like particles. - Lytic and temperate viruses <u>Section 2 – General concept of viral replication. [12 hrs.]</u> - Early events, Attachment, penetration, and un-coating. - Middle events, gene expression and genome replication. - Late events, assembly and release. <u>Section 3 – Viral life cycles. [20 hrs.]</u> - The life cycle of viruses with prokaryotic hosts. 1. Lytic bacteriophage life cycle. 2. Lysogenic bacteriophage life cycle. - Life cycle of viruses with animal host. 1. Negative single stranded and double stranded RNA animal viruses. 2. Positive single stranded RNA viruses. 3. Retro-viruses.

	- Plant viruses. - Life cycle of plant viruses. - Revision problem classes. [6 H] <u>Section 4 – Host defenses against viral infection. [25 hrs.]</u> 1. Vaccination. - Live-virus vaccine. - Killed-virus vaccine. - Recombinant virus vaccine. - Capsid and subunit vaccine. - DNA vaccines. 2. Eukaryotic cell-based defenses against viral replication. - Interferon. - Small RNA-based defenses. - Enzymatic modification of viral genomes. 3. Bacterial antiviral systems. - Bacterial restriction- modification system. - Clustered regulatory interspaced palindromic repeats. <u>Section 5 – Anti viral agents. [14 hrs.]</u> - General introduction. - Difficulties facing the development of anti-viral drugs. - Drug Discovery and Potential Targets of Antiviral Intervention. - Antiviral Drugs and Mechanisms of Action. - The common targets of anti-viral drugs.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The semester depends mainly on the active learning and interaction in the class. The students read lectures before the class and during the explanation they are expected to ask and discuss the assigned reading. The students are assessed throughout the course to monitor their learning progress and determine the weak points that need attention.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري
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	Material Covered
Week 1	Introduction to virology, virus structure and classification.
Week 2	Genome types, capsid symmetry, envelope, and Virus-like particles.
Week 3	Lytic and temperate viruses,
Week 4	Early events, Attachment, penetration, and un-coating. Middle events, gene expression and genome replication. Late events, assembly and release.
Week 5	The life cycle of viruses with prokaryotic hosts.
Week 6	Life cycle of viruses with animal host.
Week 7	Plant viruses, Life cycle of Plant viruses.
Week 8	Vaccination. Live-virus vaccine. Killed-virus vaccine. Recombinant virus vaccine. Capsid and subunit vaccine. DNA vaccines.
Week 9	Eukaryotic cell-based defenses against viral replication. Interferon. Small RNA-based defenses. Enzymatic modification of viral genomes.
Week 10	Mid-term Exam.
Week 11	Bacterial antiviral systems. Bacterial restriction- modification system. Clustered regulatory interspaced palindromic repeats.
Week 12	Anti-viral agents: General introduction. Difficulties facing the development of anti-viral drugs.
Week 13	Drug Discovery and Potential Targets of Antiviral Intervention.
Week 14	Antiviral Drugs and Mechanisms of Action.
Week 15	The common targets of anti-viral drugs.
Week 16	Final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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Week 1,2	Lab 1,2: Electron microscopy.
Week 3,4	Lab 3,4: Techniques of viral cultivation.
Week 5,6	Lab 5,6: Animal inoculation.
Week 7,8	Lab 7,8: Inoculation of embryonated egg.
Week 9,10	Lab 9,10: Cell culture (tissue culture).
Week 11,12	Lab 11,12: Cultivation of plant viruses.
Week 13,14	Lab 13,14: Cultivation of bacteriophage.
Week 15	Lab. 15: Complement fixation test.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Basic Virology. 3 rd Edition	Yes
Recommended Texts	Principles of Virology. 4 th Edition	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	Soil Microbiology		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 23018		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Dr. Taif Hussain Hassan		e-mail
			Taif.h.salman91@kus.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Mustafa Abdul Hussein Abdul Ameer	e-mail	Mustafa.a@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Enabling the student to know the microorganisms in the soil. 2. Identify the morphological characteristics of organisms in the soil. 3. Learn how to diagnose bacteria. 4. Introducing the student to the role of microorganisms in the soil. 5. Enhance the student's skills in diagnosing and counting bacteria.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Ability to apply the fundamental knowledge of bacteria, fungi, and other microbes in the soil and the techniques in the isolation and identification. 2- Ability to conduct experiments, and analyze and interpret the results. 3- Ability to identify and solve problems in the area of soil microbiology. 4- An ability to use the techniques, skills, and modern professional tools necessary for professional practice and research in the microbiology microbiology. 5- An ability to apply the relevant knowledge and scientific skills to manage a research project in the soil microbiology field.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A – [8 hrs.]</u> Historical overview, definition of microbiology, definition of soil microbiology Divisions of Soil microbes Groups of soil microbes, bacteria, fungi, actinomycetes, algae, protozoa, mycorrhizal fungi. <u>Part B – [9 hrs.]</u> Soil enzyme activities, carbon cycle Nitrogen cycle, urea hydrolysis, ammonification process Mineralization of nitrogen in soil, C/N ratio. <u>Part C – [7 hrs.]</u> Mineralization of nitrogen in soil, C/N ratio Biological nitrogen fixation Phosphorus cycle, roles of microorganisms in phosphorus cycle. Revision problem classes. [6 hrs.] <u>Part D – [8 hrs.]</u> Reduction of inorganic sulfur compounds in soil Biotransformation of iron: oxidation and reduction, decomposition of organic iron compounds Decomposition of pesticides in soil. <u>Part E – [9 hrs.]</u> Relation between microbes: the area that surrounds the rhizosphere Activities of microbes in the rhizosphere, factors that affect in the growth of microorganisms

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Many techniques and explanation methods will be used in this module to increase students' ability to learn in the soil microbiology course by encouraging students' participation in exercises, seminars, laboratory experiments, and workshops, in addition to using non-traditional learning methods such as the use of educational videos and electronic simulation equipment to improve scientific and critical thinking skills are expanded. This will be achieved through the use of the foregoing during the theoretical and practical educational classes, using simple and interesting methods that include types of simple experiments for students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	3, 9	LO from 1-9
	Assignments	1	5% (5)	10	LO from 1-9
	Projects / Lab.	1	15% (15)	Continuous	All
	Report	2	5% (10)	7, 13	LO # from 1-12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO from 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Historical overview, definition of microbiology, definition of soil microbiology
Week 2	Divisions of Soil microbes
Week 3	Groups of soil microbes, bacteria, fungi, actinomycetes, algae, protozoa, mycorrhizal fungi
Week 4	Soil enzyme activities, carbon cycle
Week 5	Nitrogen cycle, urea hydrolysis, ammonification process
Week 6	Mineralization of nitrogen in soil, C/N ratio
Week 7	Mid-term Exam
Week 8	Biological nitrogen fixation
Week 9	Phosphorus cycle, roles of microorganisms in phosphorus cycle
Week 10	Sulfur biotransformation in soil, mineralization of sulfur, soil microbial metabolism, oxidation
Week 11	Reduction of inorganic sulfur compounds in soil
Week 12	Biotransformation of iron: oxidation and reduction, decomposition of organic iron compounds
Week 13	Decomposition of pesticides in soil
Week 14	Relation between microbes: the area that surrounds the rhizosphere
Week 15	Activities of microbes in the rhizosphere, factors that affect in the growth of microorganisms
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Isolation methods of soil microbes for microbial studies, study the function of microorganisms by Rossi and Cholodny Buried Slide Technique.
Week 2	Lab 2: Estimation and counting the number of bacteria, fungi, and actinomycetes in different depths of soil by serial dilutions method.
Week 3	Lab 3: Isolation and counting of algae and protozoa from soil
Week 4	Lab 4: Measuring the decomposition rate of organic compounds that contain different ratios of carbon and nitrogen in different types of soil.
Week 5	Lab 5: Studying the nitrogen biotransformation, detection of urea, nitrite and nitrate from soil
Week 6	Lab 6: Isolation of rhizobium from different types of legumes.

Week 7	Mid-term Exam
Week 8	Lab 7: Estimation of azobacters from different types of soil by MPN (Most Probable Number).
Week 9	Lab 8: Isolation and estimation the number of Bacilli from soil.
Week 10	Lab 9: : Detect the bacteria that responsible for sulfur oxidation in soil
Week 11	Lab 10: Estimation of microorganisms in the formation of groups.
Week 12	Lab 11: Detect the bacteria that responsible for iron oxidation and counting their numbers.
Week 13	Lab 12: Effect of some pesticides on soil microorganisms especially economic microorganisms.
Week 14	Lab 13: Study the properties of rhizobium and then multiplying it, inoculation experiments of rhizobium isolated from legumes.
Week 15	Lab 14: Studying of bacteriophage in some types of soil, isolation methods of nematode from soil.
Week 16	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	علم احياء التربة المجهرية. 1989 تأليف د. غياث محمد قاسم و د. مضر عيد السلام علي. MICROBIOLOGICAL. APPLICATION. (2007). ALFRED E. BROWN.	No
Recommended Texts	Bergey's manual of systematic bacteriology	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	English Language		Module Delivery	
Module Type	B		☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	KUS 24021			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery		2
Administering Department	MBIO	College	College of Science, Department of Microbiology	
Module Leader	Assit.lec Yusur Fadhil shallal		e-mail	Yusur.fadhil@kus.edu.iq
Module Leader's Acad. Title	Assit.lec	Module Leader's Qualification	M.sc	
Module Tutor		e-mail		
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq	
Scientific Committee Approval Date	3/09/2023	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1 To develop students' understanding and correct use of English grammar in academic and everyday communication. 2 To improve students' writing skills through composing clear, organized, and grammatically accurate paragraphs and essays. 3 To enhance students' speaking abilities by encouraging effective oral communication and confident participation in discussions and presentations. 4 To strengthen students' listening skills through understanding spoken English in conversations, lectures, and audio materials. 5 To expand students' English vocabulary and improve their ability to use appropriate expressions in different contexts. 6 To enable students to integrate reading, writing, listening, and speaking skills for successful communication in academic and professional environments.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate correct use of basic and intermediate English grammar structures. 2. Write clear and organized academic paragraphs and short essays in English. 3. Communicate effectively in spoken English during discussions and presentations. 4. Understand and respond appropriately to spoken English in different contexts. 5. Use appropriate English vocabulary and expressions in academic and everyday situations.
Indicative Contents المحتويات الإرشادية	1. English grammar structures and sentence formation. (the Tens), (5 hrs) 2. Academic writing skills and paragraph development. (topics: my country - Media and Modern technology -Air pollution), (5 hrs) 3. Speaking and communication activities. Multi topics, (4 hrs) 4. Listening comprehension exercises and audio practice. (the collage), (2 hrs) 5. Vocabulary building and reading comprehension tasks. (linking words), (1 hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Interactive lectures and classroom discussions. 2. Group work and pair communication activities. 3. Listening and speaking practice sessions. 4. Writing assignments and grammar exercises. 5. Audio-visual materials and e-learning activities.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	10	10%	4,8	LO-1,2,3,4
	Assignments	10	10%	5,10	LO-2,4,5,6
	Projects	10	10%	continuous	

	Report	10	10%	13	LO-1,4
Summative assessment	Midterm Exam	1 hr	10%	7	LO-5,6,7,8
	Final Exam	3hr	50% (50)	15	ALL
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	TENSES
Week 2	Present tense
Week 3	Past tense
Week 4	Future tense
Week 5	Most common verbs list
Week 6	How to write (my country)
Week 7	Reading skills (Science and our world)
Week 8	Reading skills (Air pollution)
Week 9	Speaking (classroom discussion) air pollution in Iraq
Week 10	Debate and Dialogue
Week 11	(how to talk) Modern technology
Week 12	Mid exam 1
Week 13	Linking words to show contrast & reason
Week 14	Speaking skill (my first day at collage)
Week 15	Revision
Week 16	Final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Headway (Academic Skills)	NO
Recommended Texts	English grammar in use 5 th edition	No
Websites	https://englishonline.britishcouncil.org/	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Microbial Enzymes		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 36035		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	Microbiology	College	Science
Module Leader	Saad Hussein Khudhair	e-mail	Saad_2019@kus.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Hiba Shakir	e-mail	hiba.sh@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Understand the Fundamentals of Enzymes: Explain the structure, classification, and mechanism of action of microbial enzymes. 2. Explore Enzyme Kinetics: Analyze factors affecting enzyme activity, including temperature, pH, substrate concentration, and inhibitors. 3. Study Microbial Enzyme Production: Learn the processes of enzyme biosynthesis in bacteria, fungi, and other microorganisms. 4. Examine Industrial and Medical Applications: Understand the use of microbial enzymes in biotechnology, pharmaceuticals, food, and environmental industries. 5. Develop Laboratory Skills: Gain hands-on experience in enzyme extraction, purification, assay, and activity measurement techniques. 6. Promote Critical Analysis: Evaluate scientific literature on microbial enzymes and their applications in research and industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Student get the describe the classification, mechanisms, and roles of microbial enzymes in cellular processes. 2. Define the analyze factors affecting enzyme activity and interpret kinetic data. 3. Demonstrate enzyme production techniques: Extract, purify, and assay microbial enzymes in laboratory settings. 4. Evaluate industrial and biotechnological applications: Assess the use of microbial enzymes in food, pharmaceutical, and environmental industries. 5. Interpret experimental data: Critically analyze laboratory results and scientific literature related to microbial enzymes. 6. Solve enzyme-related problems: Design experiments to study enzyme activity, inhibition, and regulation in microorganisms.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Part A – Introduction - Enzyme Structure and Function - Enzyme Kinetics. [26 hrs.] 1. Introduction to Enzymes - o Definition and general characteristics of enzymes - o Historical background and significance in microbiology - o Classification of enzymes (EC system) 2. Enzyme Structure and Function - o Primary, secondary, tertiary, and quaternary structures - o Active sites and substrate specificity - o Cofactors, coenzymes, and prosthetic groups 3. Enzyme Kinetics - o Michaelis-Menten kinetics - o Lineweaver-Burk plot and kinetic parameters (K_m and V_{max}) - o Factors affecting enzyme activity: temperature, pH, substrate concentration, and inhibitors. Revision problem classes [7 hrs.]

	Part B – Microbial Enzyme Production - Enzyme Purification and Assay - Regulation of Enzyme Activity. [26 hrs.] 1. Microbial Enzyme Production - o Sources of microbial enzymes: bacteria, fungi, and actinomycetes - o Extracellular vs intracellular enzymes - o Fermentation strategies for enzyme production (submerged and solid-state) 2. Enzyme Purification and Assay - o Methods of enzyme extraction and purification (precipitation, chromatography, dialysis) - o Enzyme activity assays and units of measurement - o Stability and storage of microbial enzymes 3. Regulation of Enzyme Activity - o Allosteric regulation and feedback inhibition - o Induction and repression of enzyme synthesis - o Post-translational modifications affecting enzyme function Revision problem classes [7 hrs.] Part C – Industrial and Biotechnological Applications - Enzyme Inhibition and Inhibitors - Enzyme engineering. [12 hrs.] 1- Industrial and Biotechnological Applications - o Enzymes in food, pharmaceuticals, textiles, and biofuels - o Microbial enzymes in waste treatment and environmental applications - o Commercial production and economic importance 2- Enzyme Inhibition and Inhibitors - o Competitive, non-competitive, and uncompetitive inhibition - o Enzyme inhibitors in medicine and biotechnology 3- Special Topics in Microbial Enzymology - o Extremozymes (thermostable, psychrophilic, halophilic enzymes) - o Recombinant DNA technology for enzyme production - o Emerging trends in enzyme engineering and synthetic biology
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The Microbiology Enzymes course will be delivered through a combination of lectures and interactive discussions to explain fundamental concepts of enzyme structure, function, and kinetics. Visual aids such as diagrams, charts, and multimedia presentations will be used to enhance understanding. Laboratory practical sessions will provide hands-on experience in enzyme extraction, purification, and activity assays. Problem-based learning will be applied through case studies related to industrial and medical enzyme applications. Group work and student presentations will encourage teamwork and communication skills. Recent scientific literature will be introduced to develop critical reading and analytical abilities. Computer-based simulations may be used to illustrate enzyme kinetics and inhibition. Continuous assessment through quizzes, assignments, and laboratory reports will support learning progress. Regular feedback will help students improve both theoretical knowledge and practical skills.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4, 8	LO # 3,6 and 9
	Assignments	1	5% (5)	5, 10	LO # 4, 6 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المناهج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Microbial Enzymes and Their Biological Significance
Week 2	Classification and Nomenclature of Enzymes (EC System)
Week 3	Structural Organization of Microbial Enzymes
Week 4	Enzyme–Substrate Interactions and Mechanisms of Catalysis
Week 5	Assay and Quantitative Analysis of Enzyme Activity
Week 6	Factors Affecting Enzyme Activity in Microorganisms
Week 7	Principles of Enzyme Kinetics and Michaelis–Menten Theory
Week 8	Mid-term Exam
Week 9	Enzyme Inhibition and Regulation in Microbial Cells
Week 10	Biosynthesis and Regulation of Enzyme Production in Microorganisms
Week 11	Production and Roles of Intra- and Extracellular Enzymes in Microbial Systems
Week 12	Methods for Extraction and Purification of Microbial Enzymes
Week 13	Assay and Quantitative Analysis of Enzyme Activity
Week 14	Industrial and Biotechnological Applications of Microbial Enzymes
Week 15	Preparatory week before the final Exam
Week 16	The final Exam

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1, 2	Laboratory safety, introduction to Enzyme assays and data analysis.
Week 3	Qualitative detection of amylase activity produced by bacterial isolates
Week 4	Quantitative assay of amylase activity produced by bacterial isolates
Week 5,6	Determination of enzyme activity at different substrate concentrations.
Week 7	Effect of temperature on the enzyme activity
Week 8	Effect of pH on the enzyme activity
Week 9,10	Enzyme inhibition using competitive inhibitors
Week 11,12	Enzyme inhibition using non-competitive inhibitors

Week 13,14	Induction of enzyme production in microbial cultures.
Week 15	Enzyme extraction and partial purification by ammonium sulfate precipitation.
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Microbial Enzymes: Classification, Biochemistry, Production and Applications. 2025, Abdel Moneim Elhadi Sulieman, Elsevier Science & Technology Books	No
Recommended Texts	Microbial Enzymes and Biotechniques. 2020, Pratyoo Shukla. Springer Singapore	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	Biostatistics		Module Delivery
Module Type	Support		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 35031		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Dr. Ahmed A. Mnati	e-mail	mnati@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Saad Hussein Khudhair	e-mail	Saad2019@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Biostatistics provides the basic framework for thinking about data in a rigorous fashion. This course is intended both as a refresher course and as a first course in the application of statistical thinking to biological problems. Descriptive and inferential statistics will be covered, with topics including confidence intervals, basic probability, discrete and continuous distributions, t-tests, correlation, regression, chi-square tests.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Define, explain the scope and concepts of Biostatistics and its applications. - Define data, know the common sources of data and understand the various methods of data collection and presentation. - Discuss to a reasonable level the probability theories and population distribution and their applications in health and health related fields. - Define and explain the various commonly used test statistics and their applications in analyzing data in public health - Acquire the necessary knowledge and skills for data analysis and interpretation of test statistic results.
Indicative Contents المحتويات الإرشادية	<u>Module 1 Introduction to Biostatistics and Data Management</u> 1- Definition and Application of Biostatistics 2- Data, Data Sources 3- Methods of Data Collection. (10 hrs.) <u>Module 2 Organization and Presentation of Data</u> 1- Tabular Presentations 2- Diagrammatic Presentation of Data 3- Graphs. (7 hrs.) <u>Module 3 Numerical Measures</u> 1- Measures of Central Tendency 2- Measures of Dispersion or Variability 3- regression and correlation. (8 hrs.) <u>Module 4 Inferential Biostatistics</u> 1- Hypothesis Testing 2- Test of Significance and Statistical Errors. (7 hrs.) <u>Module 5 Non-Parametric Tests</u> 1-Chi-Square Test (X²). (5 hrs.)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in presenting this model is theoretical lectures and encouraging students to participate in the lectures effectively to know the basics of the subject and its vocabulary. Improving thinking skills and encouraging them to participate critically and interactively in the topics raised during the academic weeks in the theoretical and practical parts. This will be achieved through theoretical and practical classes, tutorials, and interactive tutorials by thinking about the type of simple experiments that include some sampling activities that are of interest to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	8	LO #1, 2, 3, 5,6, and 7
	Assignments	1	5% (5)	5, 10	LO # 2, 4, 6, 8, and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-9
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Statistics
Week 2	Variables
Week 3	Frequency Distributions
Week 4	Frequency Distributions
Week 5	Types of Graphs
Week 6	Measures of Central Tendency
Week 7	Measures of Central Tendency
Week 8	Measures of dispersion
Week 9	Measures of dispersion
Week 10	Midterm Exam
Week 11	Regression
Week 12	Correlation
Week 13	Hypothesis
Week 14	Chi-Square Test (X ²)
Week 15	General review of the previous lessons
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1+2	Lab1+2: Solution examples and exercises about Variables
Week 3+4	Lab 3+4: Solution examples and exercises about Types of Graphs
Week 5+6	Lab 5+6: Solution examples and exercises about Measures of Central Tendency
Week 7+8	Lab 7: Midterm Exam
Week 9+10	Lab 8+9: Solution examples and exercises about Measures of dispersion
Week 11+12	Lab 10+11: Solution examples and exercises about Regression and Correlation
Week 13+14	Lab 11+ 12: Solution examples and exercises about Chi-Square Test (X ²)

Week 15	Preparatory week
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	PAGANO, Marcello; GAUVREAU, Kimberlee; MATTIE, Heather. <i>Principles of biostatistics</i> . Chapman and Hall/CRC, 2022.	No
Recommended Texts	-----	
Websites	-----	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Food Microbiology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 35027		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	SCI
Module Leader	Dr. Hiba Abdulameer Mohamed		e-mail: Hiba.abdulameer@kus.edu.iq
Module Leader's Acad. Title	Lecturer PhD	Module Leader's Qualification	PhD Degree in Biotechnology/Molecular biology-Clinical Genetics
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	05/08/2025	Version Number	ق.أ.م. / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This module aims to: 1. Introduce students to the foundational principles of microbiology as applied to food systems. 2. Develop understanding of the roles of microorganisms in food spoilage, fermentation, and foodborne diseases. 3. Equip students with practical skills for detecting, analyzing, and controlling microbial activity in food environments. 4. Foster awareness of food safety systems, regulatory frameworks, and ethical responsibilities in food microbiology. 5. Encourage exploration of emerging technologies—including genomics, artificial intelligence, biosensors, and sustainable microbial innovations—to address modern challenges in food production and public health.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Classify food-related microorganisms and understand their ecological roles. 2. Analyze microbial growth factors and spoilage mechanisms. 3. Identify foodborne pathogens and assess public health risks. 4. Explain microbial fermentation and probiotic applications. 5. Apply detection techniques for microbial analysis in food. 6. Evaluate food safety systems like HACCP and global regulations. 7. Explore emerging technologies (genomics, AI, biosensors) in food microbiology. 8. Communicate findings professionally through reports and presentations
Indicative Contents المحتويات الإرشادية	Introduction to food microbiology: scope, history, and significance (3 hrs.) • Classification and characteristics of food-related microorganisms (6 hrs.) • Factors influencing microbial growth in food systems (3 hrs.) • Mechanisms and indicators of food spoilage (3 hrs.) • Microbial fermentation and production of functional foods (3 hrs.) • Foodborne pathogens: identification, transmission, and control (4 hrs.) • Microbial detection and enumeration techniques (e.g., plate count, PCR, ELISA) (5hrs.) • Food safety systems: HACCP, GMP, and global regulatory frameworks (5 hrs.) • Preservation methods: thermal, chemical, biological, and emerging technologies (4hrs.) • Probiotics and microbial health applications (5 hrs.) • Microbial biotechnology in food innovation (4 hrs.) • Ethical and legal considerations in food microbiology (9 hrs.) • Emerging technologies: genomics, artificial intelligence, biosensors (10 hrs.) • Sustainable microbial applications in food production (4 hrs.) • Case studies and current issues in food microbiology (4 hrs.)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- Lectures to deliver core concepts and theoretical foundations. - Laboratory sessions for hands-on microbial analysis and experimentation. - Case studies and problem-based learning to apply knowledge to real-world scenarios. - Group projects and presentations to foster collaboration and communication skills. - Independent study and guided reading to encourage self-directed exploration
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (20)	5, 10	LO #1, 2, 3 and 5, 6
	Assignments	-			
	Projects / Lab.	2	10% (20)	Continuous	
	Report	-			
Summative assessment	Midterm Exam	1 hr	10% (10)	6, 12	LO # 1-5 and 7-11
	Final Exam	3 hrs	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Food Microbiology
Week 2	Microbial Groups in Food
Week 3	Microbial Growth and Factors
Week 4	Food Spoilage Mechanisms
Week 5	Fermentation Microbiology
Week 6	Foodborne Pathogens I
Week 7	Foodborne Pathogens II
Week 8	Detection and Enumeration Methods
Week 9	HACCP and Food Safety Systems
Week 10	Preservation Techniques
Week 11	Probiotics and Functional Foods
Week 12	Microbial Biotechnology in Food
Week 13	Regulatory and Ethical Aspects; Codex Alimentarius, FDA, EFSA.
Week 14	Emerging Trends; Genomics, AI in microbiology, sustainable practices.
Week 15	Final Review and Assessment
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab safety
Week 2	Microbial isolation and identification
Week 3	Microbial isolation and identification
Week 4	Spoilage organism detection
Week 5	Fermentation monitoring I
Week 6	Fermentation monitoring II
Week 7	Exam
Week 8	Pathogen detection (PCR, ELISA, etc)
Week 9	Pathogen detection and Enumeration Methods
Week 10	HACCP simulation

Week 11	Probiotic viability testing
Week 12	Preservation Techniques I
Week 13	Preservation Techniques II
Week 14	Final Review and Assessment
Week 15	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts	• <i>Food Microbiology</i> by Frazier & Westhoff • <i>Modern Food Microbiology</i> by Jay, Loessner and Golden • <i>Fundamentals of Food Microbiology</i> by B. Ray and A. Bhunia • Introduction to Food Microbiology by A. Montgomery <i>etal</i> (FOODSAFE™ program open textbook)	No, can found by google
Websites	Youtube: eFoodhandlers Inc. Basic Food Safety (watch all six videos for an overview of the basics https://www.canada.ca/content/dam/hc-sc/healthy-canadians/migration/publications/eating-nutrition/foodborne-illness-infographic-maladies-origine-alimentaire-infographie/alt/pub-eng.pdf	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fundamentals of Immunology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 35030		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Mustafa Abdul Hussein Abdul Ameer		e-mail Mustafa.a@kus.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Saad Hussein Khudhair	e-mail	Saad2019@kus.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To give the student the fundamental of human immunity , structures and purposes of basic components of prokaryotic and eukaryotic cells especially macromolecules, membranes and organelles. 2. To understand Components of the immune system, which include cells and organs that are related to the formation of the immune system. 3. The concept of natural and acquired immunity, humoral and cellular immunity . 4. The relationship between humoral and cellular components, and the mechanics of the immune response.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic concepts of Immunity . 2. Describe the relationship innaty and Adaptive immunity . 3. Identify the types, structure, functions and lymphoid tissue of immunity . 4. Study all the types of immune cells and there function in human body . 5. Study of laboratory diagnosis and identification of some diseases that depend on immunological laboratory diagnosis
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - AN INTRODUCTION TO IMMUNOBIOLOGY AND INNATE IMMUNITY</u> Introduction of the host defense mechanisms consist of innate immunity, which mediates the initial protection against infections [17 hrs] <u>Part B – THE DEVELOPMENT OF M ATURE LYMPHOCYTE RECEPTOR REPERTOIRES</u> Development of B-lymphocytes. development of T-lymphocytes in the thymus. Positive and negative selection of T cells. Survival and maturation of lymphocytes in peripheral lymphoid tissues [17 hrs] Revision problem classes [6 hrs] <u>Part C – THE ADAPTIVE IMMUNE RESPONSE</u> The two types of adaptive immunity, humoral immunity and cell-mediated immunity, are mediated by different cells and molecules and are designed to provide defense against extracellular microbes and intracellular microbes, respectively [17 hrs] <u>Part D – THE IMMUNE SYSTEM IN HEALTH AND DISEASE</u> Just as vertebrates have developed many different defenses against pathogens, so pathogens have evolved numerous ways of overcoming them. These range from resisting phagocytosis to avoiding recognition by the adaptive immune system and even actively suppressing immune responses. We start by looking at how some pathogens keep one step ahead of the adaptive immune response. [15 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is: - Theoretical lectures and conducting practical experiments to understand and comprehend the Fundamental of immunology . - Define student groups to discuss various topics related to Fundamental of immunology by setting electronic hours for discussion. - Presentation of a seminar by each student at the end of the semester within one of the topics related to the Fundamental of immunology .
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4, 8	LO #1, 2, 3, 5,6, and 7
	Assignments	-	-		
	Projects / Lab.	1	20% (20)	Continuous	
	Report	-	-		
Summative assessment	Midterm Exam	1 hr.	10% (10)	7	LO # 1-9
	Final Exam	3 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Immunology
Week 2	Non -specific (natural or innate) immunity
Week 3	Adaptive immunity
Week 4	Antibody and Antigen
Week 5	Tissues of the Immune System
Week 6	Professional and Non-professional phagocytes
Week 7	Mid-term Exam
Week 8	Major histocompatibility complex (MHC) molecule
Week 9	COMPLEMENT SYSTEM
Week 10	Cytokines
Week 11	Immunological tolerance
Week 12	Hypersensitivity diseases
Week 13	Anti-Parasite immunity
Week 14	<i>Immune Responses against Tumors 1</i>
Week 15	<i>Immune Responses against Tumors 2</i>
Week 16	Final -term Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Safety instructions in immunology laboratory
Week 2	Lab 2: Materials and equipment used in immunology laboratory
Week 3	Lab 3: Preparation of different antigens
Week 4	Lab 4: Experimental animals in immunological lab
Week 5	Lab 5: Serological reactions.
Week 6	Lab 6: Hemagglutination reaction.
Week 7	Mid Exam
Week 8	Lab 7: Human Chorionic Gonadotropin (HCG) tests.
Week 9	Lab 8: Latex agglutination reaction .

Week 10	Lab 9: C-reactive protein Test.
Week 11	Lab 10: Anti Streptolysin O Test (ASOT).
Week 12	Lab 11: Precipitation Reaction.
Week 13	Lab 12: Immunodiffusion .
Week 14	Lab 13: Widal test and Rose Bengal test 1
Week 15	Lab 14: Widal test and Rose Bengal test 2
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Basic Immunology Functions and Disorders of the Immune System	No
Recommended Texts	JANEWAY'S Immunobiology Kenneth Murphy Washington University School of Medicine, St. Louis	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	Histopathology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 35028		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	3	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Dr. Genan Adnan Abdullatef Al-Bairuty		e-mail
			galbairuty@gmail.com or galbairuty@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Asmaa Sami	e-mail	asmaasami@kus.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق.أ.م. / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Histopathology is a fundamental focus taught in both human and veterinary medical schools. This field serves as the basis for the remainder of the sciences, including anatomy, animal physiology, human physiology, histology, immunohistochemistry, and others. The following are the aims of this module: 1. Developing scientific and qualitative cadres specializing in histopathology with the goal of enhancing the country's educational reality. 2. Providing professional experts with expertise in histopathology to the Ministry of Health. 3. Using current research techniques to get at the most recent scientific discoveries in the field of histopathology to teach students verbal, written, and diagnostic abilities. 4. The program works to give students a top-notch education in the theoretical and practical aspects of histopathology, which benefits the institution.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student should have a working knowledge of histopathology's fundamental ideas. 2. The student must be able to distinguish between the several categories of healthy and diseased tissues. 3. The student should be skilled in using the tools and equipment's of the lab for tissue preparations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction to histopathology and Techniques of studying pathology</u> Definition of disease, disease causes, important terms, terms related to histopathology types of pathology, classification of diseases, disease manifestation, definition of etiology, etiology factors. Gross examination, light microscopy examination, immunohistochemistry, immunofluorescence, electron microscopy, molecular pathology, pathology stains, diagnostic methods of diseases (Histopathology, biochemistry, microbiology, haematology, histochemistry, forensic pathology, toxicology) [5 hrs] <u>Part B – Cell injury and intracellular accumulation</u> Causes of cell injury, mechanism of cell injury, types of cell injury, reversible and irreversible cell injury, Mechanism of intracellular accumulation, lipids, cholesterol and cholesteryl esters, proteins, glycogen, pigments, pathologic calcification, cellular aging, abnormalities of cellular aging. [6 hrs] <u>Part C –Inflammation</u> Inflammation terminology, main function, harmful effects, the typical inflammatory reaction develops, Components of inflammation, classification of inflammation, the

	cardinal signs of inflammation, general characteristic of inflammation, acute inflammation, causes of acute inflammation, activation of leukocytes, outcomes of acute Inflammation, chemical mediator of acute inflammation, types of chemical mediator, action mode of mediator, regulation of mediator action, systemic appearance of inflammation. . [7 hrs] Revision problem classes. [3 hrs] <u>Part D – Chronic inflammation</u> Chronic inflammation definition, causes of chronic Inflammation, morphologic features of chronic inflammation, characterization of chronic inflammation, cells of chronic inflammation, other cells in chronic inflammation, granulomatous Inflammatory, morphology, microscopically. [4 hrs] <u>Part E – Neoplasia</u> Definition, nomenclature and classification, cancer phenotype and stem cells, gross appearance, microscopic features, cytomorphology of neoplastic cells, Dysplasia. [4 hrs] <u>Part F – Degeneration and necrosis</u> Definition of degeneration, cell injury classification, types of degenerative changes, definition of necrosis, necrosis mechanisms, main types of necrosis, gangrene. [3 hrs] <u>Part G –Cellular adaptation and tissue repair</u> Cellular adaptation, forms of adaptation, hyperplasia, hypertrophy, atrophy, metaplasia, tissue repair types, the cell cycles, control of cell proliferation, Growth factors, action mechanism of growth factors, extracellular matrix (ECM) and cell-matrix interactions, Interstitial Matrix, Basement Membrane, roles of the extracellular matrix, components of the Extracellular Matrix, Repair by connective tissue deposition, steps of repair by connective tissue deposition, repair types according to the tissue types, factors that influence tissue repair (causes Delay Healing), tissue repair and fibrosis examples, differences between secondary healing and primary healing. [5 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This module will teach students how to diagnose abnormal tissue (histopathology) and use a technique to prepare tissue section slides through a variety of methods, such as participation in lab practice, seminars, workshops, and educational movies. Courses, interactive tutorials, and the assessment of tissue section slide examinations will all be used to achieve this.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	4, 9	LO #1, 2,3, 5, 6, 7, and 8
	Assignments	1	5% (5)	5, 10	LO # 3, 4, 6 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	12	LO # 11
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Week 1	Introduction to histopathology, disease definition and causes, important terms, terms related to histopathology
Week 2	Etiology, Definition of etiology and etiology factors
Week 3	Studying pathology techniques, Gross examination, light microscopy examination, immunohistochemistry, immunofluorescence, electron microscopy, molecular pathology, and types of pathology stains
Week 4	Methods of diseases diagnosis, histopathology, biochemistry, microbiology, haematology, histochemistry, forensic pathology, toxicology
Week 5	Cell injury definition, causes of cell injury, mechanism of cell injury, types of cell injury, reversible and irreversible cell injury
Week 6	Intracellular accumulation, mechanism of intracellular accumulation, lipids, cholesterol and cholesteryl esters, proteins, glycogen, pigments, pathologic calcification, cellular aging, abnormalities of cellular aging
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Definition of Inflammation and terminology, main function of inflammation, harmful effects of inflammation, the typical inflammatory reaction develops, Components of inflammation, classification of inflammation, the cardinal signs of inflammation, general characteristic of inflammation, acute inflammation, causes of acute inflammation, activation of leukocytes
Week 9	Outcomes of acute Inflammation, chemical mediator of acute inflammation, types of chemical mediator, action mode of mediator, regulation of mediator action, systemic Appearances of Inflammation
Week 10	Chronic inflammation definition, causes of chronic Inflammation, morphologic features of chronic inflammation, characterization of chronic inflammation, cells of chronic inflammation, other cells in chronic inflammation, granulomatous Inflammatory, morphology, microscopically
Week 11	Neoplasia, nomenclature and classification, cancer phenotype and stem cells, gross appearance, microscopic features, cytomorphology of neoplastic cells, Dysplasia
Week 12	Degeneration, cell injury classification and types of degenerative changes
Week 13	Necrosis, definition of necrosis, necrosis mechanisms, main types of necrosis, gangrene
Week 14	Cellular adaptation, forms of adaptation, hyperplasia, hypertrophy, atrophy, metaplasia,
Week 15	Tissue repair healing by regeneration and fibrosis, tissue repair types, the cell cycles, control of cell proliferation, Growth factors, action mechanism of growth factors, extracellular matrix (ECM) and cell-matrix interactions, Interstitial Matrix, Basement Membrane, roles of the extracellular matrix, components of the Extracellular Matrix, Repair by connective tissue deposition, steps of repair by connective tissue deposition, repair types according to the tissue types, factors that influence tissue repair (causes Delay Healing), tissue repair and fibrosis examples, differences between secondary healing and primary healing
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Lab1,2: Introduction to histopathology
Week 3,4	Lab 3,4: Immunohistochemistry technique
Week 5,6	Lab 5,6: Cell injury
Week 7,8	Lab 7,8: inflammation
Week 9,10	Lab 9,10: Neoplasia
Week 11,12	Lab 11,12: Amyloidosis
Week 13,14	Lab 13,14: Thrombosis
Week 15	Preparatory week before final exam
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Kumar, V.; Abbas, A.K.; Aster, J.C. K.A. (2018). Robbins Basic Pathology, 10 th Edition. Elsevier Inc. P.910	No
Recommended Texts		
Websites	Wikipedia , YouTube , Google search	

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	Microbial genetics		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 35026		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	Sc.
Module Leader	Thamer mouhi Jasiem		e-mail: thamerm@kus.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	Dr.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	05/08/2025	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 Aims أهداف المادة الدراسية	1. To develop problem-solving skills and an understanding of the principles and techniques used in microbial genetics research. 2. To gain knowledge and comprehension of the fundamental concepts and theories underlying microbial genetics, including gene expression, mutation, recombination, and genetic variation. 3. To learn and apply various laboratory techniques and methodologies used in studying microbial genetics, such as DNA extraction, amplification, cloning, and sequencing. 4. To understand the role of microbial genetics in important biological processes, such as microbial evolution, pathogenesis, and biotechnology applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the fundamental principles and mechanisms of microbial genetics, including gene structure, replication, transcription, and translation. 2. Demonstrate an understanding of the mechanisms of genetic variation, such as mutation, recombination, and horizontal gene transfer, and their significance in microbial evolution. 3. Apply the knowledge of microbial genetics to interpret and analyze experimental data related to gene expression, regulation, and genetic mapping. 4. Evaluate the role of microbial genetics in various biological processes, such as microbial pathogenesis, antibiotic resistance, and industrial applications.
Indicative Contents المحتويات الإرشادية	Indicative Contents - Microbial Genetics <u>Part A - Introduction to Microbial Genetics</u> Historical overview of microbial genetics Basic concepts in genetics: genes, DNA, RNA, and proteins Structure and function of bacterial genomes Replication, transcription, and translation processes in bacteria Genetic variation and mutation in microbial populations(10 hr) <u>Part B - Genetic Analysis Techniques</u> Isolation and cultivation of microorganisms for genetic studies DNA extraction and purification methods Polymerase chain reaction (PCR) and its applications in microbial genetics DNA sequencing techniques: Sanger sequencing and next-generation sequencing Genetic engineering tools: plasmids, restriction enzymes, and cloning vectors(15 hr) <u>Part C - Gene Expression and Regulation</u>

	Transcriptional regulation in bacteria: promoters, operators, and transcription factors (15 hr) <u>Part D - Horizontal Gene Transfer</u> Transformation: uptake and integration of exogenous DNA Conjugation: transfer of genetic material through cell-to-cell contact Transduction: transfer of DNA by bacteriophages Mobile genetic elements: plasmids, transposons(12 hr) <u>Part E - Mutations and Genetic Variation</u> Types of mutations: point mutations, insertions, deletions, and frameshift mutations Mutagenesis: chemical and physical agents that induce mutations DNA repair mechanisms: mismatch repair, base excision repair, and nucleotide excision repair(10 hr)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	The main strategies that will be ➤ Group Activities and Discussions: Organizing group activities, such as case studies and group discussions, where students can collaborate, share their perspectives, and analyze complex problems in microbial genetics. This encourages teamwork, enhances critical thinking, and promotes effective communication skills. ➤ Problem-Solving Exercises: Providing regular problem-solving exercises and assignments that require students to apply their knowledge of microbial genetics to solve practical problems. These exercises will challenge students to think critically, analyze data, and develop logical solutions. ➤ Continuous Assessment and Feedback: Implementing regular assessments, quizzes, and feedback mechanisms to monitor students' progress and provide timely guidance. This helps students identify areas for improvement and encourages them to actively engage with the material throughout the module.		
	Student Workload (SWL) الحمل الدراسي للطالب		
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (20)	5, 10	LO #1, 2, 3 and 5, 6
	Assignments	-			
	Projects / Lab.	2	10% (20)	Continuous	
	Report	-			
Summative assessment	Midterm Exam	1 hr	10% (10)	6 ,12	LO # 1-5 and 7-11
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction in Microbial genetics , Applications of Microbial genetics
Week 2	Bacterial Genome
Week 3	DNA Mutations, Types of Mutations
Week 4	Mutagenesis DNA Repair ,
Week 5	Nucleotide Excision Repair System, Base excision repair
Week 6	Horizontal Gene Transfer , Conjugation
Week 7	Mid-term Exam
Week 8	Transformation, Transduction
Week 9	Cloning Vector , Characteristics of the cloning vector
Week 10	Regulation of gene expression in prokaryotes , Operon
Week 11	Enzymes In Genetics , Restriction Enzymes
Week 12	Polymerase Chain Reaction, Types of PCR , Applications of PCR
Week 13	Sequencing Methods 1
Week 14	Sequencing Methods 2
Week 15	Preparatory week
Week 16	final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Bacterial genomic DNA isolation
Week 2	Lab 2: Agarose gel electrophoresis
Week 3	Lab 3: Plasmid DNA isolation
Week 4	Lab 4: Restriction digestion
Week 5	Lab 5: Preparatory week
Week 6	Lab 6: Midterm Exam 1
Week 7	Lab 7: Transformation of E. coli with pUC18
Week 8	Lab 8: Polymerase chain reaction
Week 9	Lab 9: Soil DNA isolation and purification
Week 10	Lab 10: Bacterial RNA isolation
Week 11	Lab 11: Preparatory week
Week 12	Lab 12: Midterm Exam 2
Week 13	Lab 13: Bacterial protein profiling using SDS PAGE1
Week 14	Lab 14: Bacterial protein profiling using SDS PAGE2
Week 15	Lab 15: Preparatory week
Week 16	Lab 16: Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Molecular genetics of bacteria 5 th edition Jeremy W. Dale and Simon F. Park University of Surrey, UK	Yes
Recommended Texts		
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
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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	Microbial Physiology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 35029		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Hiba Shakir Ahmed		e-mail: hiba.sh@kus.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification: Ph.D.
Module Tutor	-----		e-mail: -----
Peer Reviewer Name	Dr. Saad Hussein		e-mail: saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To learn the student how to recognizes the types of microbes that cause humans disease and their classification. 2. To study the component of the microorganisms and to study the functions of the Bacterial cell; how bacterial cell grow, divide, reproduce, move, feed; how uptake nutrients, synthesize sugar, proteins, lipids, nucleic acids, also studying the effect of different conditions on the cell. 3. The student will be familiar with the most important clinical symptoms and the mechanism of disease occurrence. 4. The student studies methods of diagnosing of microorganisms using electron microscopy, polymerase chain reaction technique, and methods of identifying them. 5. Know the most important ways to prevent microbial infections.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing students to laboratory skills and their relationship to the applicable health system 2. Providing students with the knowledge to conduct appropriate studies to know the most important pathogenic microbes that society suffers from, their causes, how to distribute diseases and the impact of various factors on them, and to know the most appropriate ways to solve these problems. 3. Seeking to prepare scientists and researchers with medical laboratory skills of a research nature. 4. Interacting with scientific and technical experiences and expertise in a way that serves the community. 5. Providing students with the basic skills to conduct various medical studies 6. Provide students with sufficient cognitive skills to know the causes of microbial diseases and how to prevent them.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – The Bacterial Cell</u> The Structure and function definitions, cell wall and plasma membrane components, study the Components outside the cell wall . Microbial Nutrition I - macroelements and microelements and study the growth factors with study the uptake of nutrients by the microbial cell Growth curve II - Phase diagrams, definition of growth curve and study the major four phases of microbial growth . Reproduction in bacterial, study the two types of reproductions I. Asexual Reproduction ,study all the types of asexual reproductions and II. Sexual reproduction or Genetic recombination in bacteria. [28 hrs.]

	Revision problem classes [5 hrs.] <u>Part B – fundamentals</u> DNA Replication in Prokaryote (E-coli). Study the three level of replications include the initiation , elongation and termination and explain the enzyme and protein that Involved in replication in bacteria. Influence of Environmental Factors on Growth,such as acidic alkaline condition, temperature and study the other conditions may effect in microbial growth. Energy, Oxidation-Reduction Reactions and Electron Carriers. Energy Release and Conservation. The Glycolytic Pathway ,explain the Embden-Meyerhof or glycolytic pathway or glycolysis [29 hrs.]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	4, 8	LO #1, 2, 3,5,6 and 7
	Assignments	1	5% (5)	5, 10	LO #2, 4, 6 ,8 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Introduction for microbial physiology Bacterial cell Structure and function
Week 2	Microbial Nutrition
Week 3	Uptake of nutrients by the cell
Week 4	Microbial growth
Week 5	Reproduction in bacterial, I. Asexual Reproduction
Week 6	II. Sexual reproduction or Genetic recombination in bacteria
Week 7	Mid-term Exam
Week 8	DNA Replication in Prokaryote (E-coli) part I
Week 9	DNA Replication in Prokaryote (E-coli) part II
Week 10	Influence of Environmental Factors on Growth
Week 11	Influence of Environmental Factors on Growth
Week 12	Energy, Oxidation-Reduction Reactions and Electron Carriers
Week 13	Energy Release and Conservation
Week 14	The Glycolytic Pathway
Week 15	Preparatory week before the final Exam
Week 16	The final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Lab 1,2: Introduction to culture media
Week 3,4	Lab 3,4: mechanism in bacterial staining
Week 5,6	Lab 5,6: growth curve in bacteria
Week 7,8	Lab 7,8: microbial growth requirements
Week 9,10	Lab 9,10: factor effecting microbial growth
Week 11,12	Lab 11,12: bacterial counting
Week 13,14	Lab 13,14: Biofilm
Week 15	Lab 15: Revision
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Microbial Physiology. Albert G Moat, John W Foster, Michael P. Spector. 2002. Fourth Edition. A John Wiley and sons, INC., publication.	No
Recommended Texts	Microbiology. Lansing M Prescott, John P. Harley, Donald A. Klein. 2005. Sixth Edition. Higher Education. Microbial an introduction. 2004. Gerard J Tortora, Berdell R Funke, Christine L Case. Eighth Edition.	No
Websites	https://scholar.google.com/	

Grading Scheme

مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Aquatic microbiology		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MBO 24022			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		2
Administering Department	MBO	College	SC	
Module Leader	Dr. Sraa Nsayef Muslim		e-mail	Sraa.N.Muslim@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	-----		e-mail	-----
Peer Reviewer Name	Dr.Saad Hussein Khudhair		e-mail	Saad2019@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	----	Semester	----
Co-requisites module	----	Semester	----

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. This course give an overview of microorganism living in water . 2. The importance of water microorganisms as producers or polluted agents. 3. This course will provide student with background knowledge and quantitative and analytical skills about : Aquatic ecosystems, properties of water and its suitability for biology, factors effect on the growth and activity of aquatic microorganism, organic production in environmental systems and the role of microorganism in it.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Study the methods used in sampling from aquatic environment in the right ways for purpose of conducting microbiological analysis and microbial count and isolate from it. Isolation and identification methods on aquatic microorganisms and pure culture. 2. Students are able to identify and manage microbes to increase aquaculture production. 3. The topics provide students with an understanding of water organisms, their type's numbers, and activities. Participants able to discuss water life in relation to human existence, and the environment.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A – Aquatic Microbiology</u> Aquatic microbiology, Natural water, Atmospheric water, ground water , import of aquatic microorganisms , the aquatic environment conditions . [12 hrs.] <u>Part B – water Microbial pollution</u> Main source of water microbial pollution , water associated disease , indicators of microbial contamination of Drinking water . [10 hrs.] Revision problem classes. [2 hrs.] <u>Part C – Bacteriological water analysis and water treatment</u> Approach, methodological, multiple tube method, ATP Testing, plate count, membrane filtration, Pour plate method, Steps of water treatment. [6 hrs.] <u>Part D – Biological wastewater treatment</u> Measurement of organic matter (Biochemical oxygen demand, chemical oxygen demand, Total organic carbon) , Biofilms in Drinking Water Distribution Systems, Factors causing biofilm growth. [12 hrs.] <u>Part E – Water purification</u> Pretreatment (Pumping and containment, Screening, Storage, Pre-chlorination), pH adjustment, Removal of ions and other dissolved substances. [8 hrs.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Many strategies will be used in this module to encourage students to learn such as participation in the exercises, seminars, lab experiments, and workshops, as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some interesting sampling activities for the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	50	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب اسبوعيا	3.33
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	5% (5)	8	LO #1, 2, 3, 5,6, and 7
	Assignments	2	5% (10)	5, 10	LO # 2, 4, 6, 8, and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction OF Aquatic Microbiology
Week 2	Importance of aquatic microorganisms
Week 3	The aquatic environment conditions
Week 4	Water Microbial Pollution
Week 5	Water-associated diseases
Week 6	<i>Indicators of Microbial Contamination of Drinking Water(1)</i>
Week 7	Mid-term Exam
Week 8	<i>Indicators of Microbial Contamination of Drinking Water(2)</i>
Week 9	Bacteriological water analysis
Week 10	Water Treatment (1)
Week 11	Water Treatment (2)
Week 12	Biological Wastewater Treatment
Week 13	Water purification
Week 14	Removal of ions and other dissolved substances
Week 15	Revision
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: way to collect water samples for the purpose of microbiological studies
Week 2	Lab 2: Isolation and enumeration of water bacteria
Week 3	Lab 3: Enumeration of total bacterial count in water, with most probable number method (M.P.N)
Week 4,5	Lab 4,5: Detection of fecal pollution
Week 6	Lab6: isolation <i>E.coli</i> bacteria
Week 7,8	Lab 7,8 :isolation of <i>Clostridium perfringens</i> from water
Week 9,10	Lab 9,10:Isolate and enumerate fecal streptococci group
Week 11,12	Lab 11,12: Isolation and identification of <i>Salmonella</i> and <i>shigella</i>

Week 13,14	Lab 13,14: Isolation and identification of Vibrio from water
Week 15	Revision
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Aquatic Microbiology; Rheinheimer, Gerhard; 3 rd edition 1985	No
Recommended Texts	Environmental Microbiology of Aquatic and waste systems, Nduka Okafor . 2011	No
Websites	https://www.perlego.com/book/1858097/advances-in-aquatic-microbiology-pdf	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Pathogenic bacteria		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 31129		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Hanan Abdullah Ali	e-mail	Hanan1974@kus.edu.iq
Module Leader's Acad. Title	Doctorate lecture	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Saad Hussein	e-mail	Saad_2019@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Bacteriology (MBO 21116)	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Introduce students to the most important virulence factors of bacteria 2- How to diagnose the bacterial infection based on symptoms, prevent it, and find the appropriate treatment 3- The mechanism of disease occurrence by each pathogenic bacteria ,which includes many types such as Streptococcus pyogenes , Streptococcus pneumonia, Staphylococcus epidermidis, Bacillus anthracis , Bacillus cereus. Clostridium difficile. Clostridium tetani. K. pneumonia ,etc.. 4- Understanding the relationship between bacteria and humans to investigate the causes of diseases and how they occur
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Provide the student with a skill in how to take and preserve samples, grow them and diagnose . 2. Introducing how the disease resulting from bacterial infections spreads and the possibility of epidemics 3. Teaching the student how to use laboratory tools and equipment during the growth and diagnosing bacteria and analyze laboratory results. 4. Identify the types of bacteria that cause diseases in humans
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A –</u> INTRODUCTION to know the criteria that were established to identify the causative agent of a particular disease and Factors that Influence the degree of Pathogenicity and development the Infection and Disease . Besides, the Steps of Bacteria to causes infection and disease in humans (10 hrs) Diagnosis the most important types of pathogens belonging to the GRAM POSITIVE COCCI: Genus Staphylococci. Genus Streptococci., and identification of the most important diseases that cause, symptoms, and how to prevent and treat them. (9 hrs) Diagnosis the most important types of pathogens belonging to the GRAM POSITIVE SPORE FORMING RODS. Genus Bacillus. Genus Clostridium., and identification of the most important diseases that cause, symptoms, and how to prevent and treat them. (11 hrs) Revision problem classes. [6 hrs]

	<u>Part B – fundamentals</u> Diagnosis the most important types of pathogens belonging to the GRAM POSITIVE NON-SPORE FORMING RODS. GENUS CORYNEBACTERIA., and identification of the most important diseases that cause, symptoms, and how to prevent and treat them. (12 hrs) Diagnosis the most important types of pathogens belonging to the GRAM NEGATIVE DIPLOCOCCI: GENUS: NEISSERIA and identification of the most important diseases that cause, symptoms, and how to prevent and treat them. (7 hrs) Diagnosis the most important types of pathogens belonging to the GRAM NEGATIVE COCCOBACILLI. GENUS: HAEMOPHILUS and identification of the most important diseases that cause, symptoms, and how to prevent and treat them. (10 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The strategy used in this curriculum is characterized by strengthening students in finding solutions to problems they may encounter through participation in exercises and broadening students' horizons through interactive activities and practical experiences.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5 % (5)	4, 8	LO #1, 2, 3,5,6 and 7
	Assignments	2	10 % (10)	5, 10	LO #2, 4, 6 ,8 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to bacteriology
Week 2	Relationships between human and microorganisms
Week 3	Harmful and harmless bacteria
Week 4	GRAM POSITIVE COCCI: Genus Staphylococci
Week 5	GRAM POSITIVE COCCI: Genus Streptococci.
Week 6	GRAM POSITIVE SPORE FORMING RODS : Genus Bacillus.
Week 7	Mid- term exam
Week 8	GRAM POSITIVE SPORE FORMING RODS : Genus Clostridium.
Week 9	GRAM NEGATIVE RODS : ENTEROBACTERIACEAE.
Week 10	GRAM NEGATIVE RODS : ENTEROBACTERIACEAE.
Week 11	GRAM POSITIVE NON-SPORE FORMING RODS. GENUS
Week 12	GRAM POSITIVE NON-SPORE FORMING RODS. GENUS.
Week 13	GRAM NEGATIVE DIPLOCOCCI. GENUS: NEISSERIA
Week 14	Bacterial nosocomial infections
Week 15	Preparatory week before the final exam
Week 16	The final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Lab 1,2: Laboratory Diagnosis of <i>Staphylococcus</i> spp.
Week 3,4	Lab 3,4: Laboratory Diagnosis of <i>Streptococcus</i> spp.
Week 5,6	Lab 5,6: Laboratory Diagnosis of <i>Bacillus</i> spp.
Week 7,8	Lab 7,8: Laboratory Diagnosis of <i>Pseudomonas</i> spp.
Week 9,10	Lab 9,10: Laboratory Diagnosis the species of Enterobacteriaceae family
Week 11,12	Lab 11,12: Laboratory Diagnosis the species of Enterobacteriaceae family
Week 13,14	Lab 13,14: lethal dose 50%
Week 15	Preparatory week before the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Bacterial Pathogens and Their Virulence Factors. D. I. Johnson.2018. Springer International Publishing AG. 2-Foodborne Disease Handbook, Vol. 1: Bacterial Pathogens.Y.H.Hui., M.D.Pterson ,J.R.Gorham.2001. Marcel Dekker; 2nd Revised & enlarged edition.	No
Recommended Texts	1- Human Pathogenic Microbes.M.Mir.2022.Academic press. 2- Microbes: Concepts and Applications. <u>Prakash S. Bisen</u> , Mousumi Debnath, G. B. Prasad. 2012. Wiley-Blackwell.	No
Websites	https://www.ncbi.nlm.nih.gov/books/NBK8526/ https://www.medicalnewstoday.com/articles/pathogens-definition	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	biotechnology		Module Delivery
Module Type	Core		☒ Theory ☒ Lab ☒ Tutorial ☐ Lecture ☐ Practical ☐ Seminar
Module Code	MBO 314		
ECTS Credits	6		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Inas Sattar Abd	e-mail	Inasabd4@kus.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.zainab thamer	e-mail	
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The course aims to: 1. Provide students with fundamental knowledge in the field of biotechnology. 2. Explain the molecular techniques used in genetic engineering. 3 Enhance awareness of bioethics and biosafety.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge Understanding the principles and techniques of modern biotechnology. Familiarity with the fundamentals of genetic engineering and its applications. B. Skills Performing basic laboratory techniques such as PCR and gel electrophoresis. Analyzing and interpreting laboratory results. C. Competencies Working effectively within a laboratory team. Adhering to research ethics and biosafety standards.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Biotechnology, its branches, and modern applications. Structure and organization of genetic material (DNA, RNA) and its relationship to biotechnology. Types of enzymes used in genetic engineering and their mechanisms of action. Genetic vectors (plasmids, vectors) and their applications. Steps and techniques of recombinant DNA. Principles of gene cloning and protein expression. Fundamentals and techniques of polymerase chain reaction (PCR) and its applications. Separation and molecular analysis techniques (gel, electrophoresis). Medical applications of biotechnology (molecular diagnostics, vaccines). Industrial and microbial applications of biotechnology. Agricultural applications of biotechnology.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Interactive lectures based on dialogue and questioning. Problem-Based Learning Laboratory-Based Learning Collaborative and group learning. Case studies in medical and industrial applications. Student presentations. Guided self-directed learning using modern scientific resources. Using modern educational media (scientific video presentations).

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	3,,6	LO # 2, 3, 4, 6, 7 and 8
	Assignments	2	5% (10)	6, 12	LO # 3, 4, 5, 9, 10 and 11
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	14	LO # 10, 11 and 12
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO # 1-5
	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 biotechnology
Week 2	biomass
Week 3	History of biochar
Week 4	Genetic engineering I
Week 5	Genetic engineering II
Week 6	Mid-term Exam.
Week 7	Polymerase chain reaction
Week 8	Gene therapy
Week 9	Medical biotechnology
Week 10	Environmental biotechnology
Week 11	Industrial and microbial biotechnology
Week 12	Agricultural biotechnology
Week 13	Final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: biotechnology
Week 2	Lab2: Microbial culture and microbial growth
Week 3	Lab3: genetic engineering
Week 4	Lab4: Isolation of DNA I
Week 5	Lab5: Isolation of DNA II
Week 6	Lab6: Mid-term Exam
Week 7	Lab7: Polymerase chain reaction.
Week 8	Lab8: Agarose gel electrophoresis
Week 9	Lab9: Polymerase chain reaction part I
Week 10	Lab 10: Industrial and microbial biotechnology
Week 11	Lab 11: Medical biotechnology
Week 12	Lab 12: Environmental biotechnology
Week 13	Final Exam.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	biotechnology (John E.Smith)	No
Recommended Texts	biotechnology (John E.Smith)	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	Microbial Enzymes		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 36035		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	
Administering Department	Microbiology	College	Science
Module Leader	Saad Hussein Khudhair	e-mail	Saad_2019@kus.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr. Hiba Shakir	e-mail	hiba.sh@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Understand the Fundamentals of Enzymes: Explain the structure, classification, and mechanism of action of microbial enzymes. 2. Explore Enzyme Kinetics: Analyze factors affecting enzyme activity, including temperature, pH, substrate concentration, and inhibitors. 3. Study Microbial Enzyme Production: Learn the processes of enzyme biosynthesis in bacteria, fungi, and other microorganisms. 4. Examine Industrial and Medical Applications: Understand the use of microbial enzymes in biotechnology, pharmaceuticals, food, and environmental industries. 5. Develop Laboratory Skills: Gain hands-on experience in enzyme extraction, purification, assay, and activity measurement techniques. 6. Promote Critical Analysis: Evaluate scientific literature on microbial enzymes and their applications in research and industry.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Student get the describe the classification, mechanisms, and roles of microbial enzymes in cellular processes. 2. Define the analyze factors affecting enzyme activity and interpret kinetic data. 3. Demonstrate enzyme production techniques: Extract, purify, and assay microbial enzymes in laboratory settings. 4. Evaluate industrial and biotechnological applications: Assess the use of microbial enzymes in food, pharmaceutical, and environmental industries. 5. Interpret experimental data: Critically analyze laboratory results and scientific literature related to microbial enzymes. 6. Solve enzyme-related problems: Design experiments to study enzyme activity, inhibition, and regulation in microorganisms.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Part A – Introduction - Enzyme Structure and Function - Enzyme Kinetics. [26 hrs.] 1. Introduction to Enzymes - o Definition and general characteristics of enzymes - o Historical background and significance in microbiology - o Classification of enzymes (EC system) 2. Enzyme Structure and Function - o Primary, secondary, tertiary, and quaternary structures - o Active sites and substrate specificity - o Cofactors, coenzymes, and prosthetic groups 3. Enzyme Kinetics - o Michaelis-Menten kinetics - o Lineweaver-Burk plot and kinetic parameters (K_m and V_{max}) - o Factors affecting enzyme activity: temperature, pH, substrate concentration, and inhibitors. Revision problem classes [7 hrs.]

	Part B – Microbial Enzyme Production - Enzyme Purification and Assay - Regulation of Enzyme Activity. [26 hrs.] 1. Microbial Enzyme Production - o Sources of microbial enzymes: bacteria, fungi, and actinomycetes - o Extracellular vs intracellular enzymes - o Fermentation strategies for enzyme production (submerged and solid-state) 2. Enzyme Purification and Assay - o Methods of enzyme extraction and purification (precipitation, chromatography, dialysis) - o Enzyme activity assays and units of measurement - o Stability and storage of microbial enzymes 3. Regulation of Enzyme Activity - o Allosteric regulation and feedback inhibition - o Induction and repression of enzyme synthesis - o Post-translational modifications affecting enzyme function Revision problem classes [7 hrs.] Part C – Industrial and Biotechnological Applications - Enzyme Inhibition and Inhibitors - Enzyme engineering. [12 hrs.] 1- Industrial and Biotechnological Applications - o Enzymes in food, pharmaceuticals, textiles, and biofuels - o Microbial enzymes in waste treatment and environmental applications - o Commercial production and economic importance 2- Enzyme Inhibition and Inhibitors - o Competitive, non-competitive, and uncompetitive inhibition - o Enzyme inhibitors in medicine and biotechnology 3- Special Topics in Microbial Enzymology - o Extremozymes (thermostable, psychrophilic, halophilic enzymes) - o Recombinant DNA technology for enzyme production - o Emerging trends in enzyme engineering and synthetic biology
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The Microbiology Enzymes course will be delivered through a combination of lectures and interactive discussions to explain fundamental concepts of enzyme structure, function, and kinetics. Visual aids such as diagrams, charts, and multimedia presentations will be used to enhance understanding. Laboratory practical sessions will provide hands-on experience in enzyme extraction, purification, and activity assays. Problem-based learning will be applied through case studies related to industrial and medical enzyme applications. Group work and student presentations will encourage teamwork and communication skills. Recent scientific literature will be introduced to develop critical reading and analytical abilities. Computer-based simulations may be used to illustrate enzyme kinetics and inhibition. Continuous assessment through quizzes, assignments, and laboratory reports will support learning progress. Regular feedback will help students improve both theoretical knowledge and practical skills.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4, 8	LO # 3,6 and 9
	Assignments	1	5% (5)	5, 10	LO # 4, 6 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	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 Microbial Enzymes and Their Biological Significance
Week 2	Classification and Nomenclature of Enzymes (EC System)
Week 3	Structural Organization of Microbial Enzymes
Week 4	Enzyme–Substrate Interactions and Mechanisms of Catalysis
Week 5	Assay and Quantitative Analysis of Enzyme Activity
Week 6	Factors Affecting Enzyme Activity in Microorganisms
Week 7	Principles of Enzyme Kinetics and Michaelis–Menten Theory
Week 8	Mid-term Exam
Week 9	Enzyme Inhibition and Regulation in Microbial Cells
Week 10	Biosynthesis and Regulation of Enzyme Production in Microorganisms
Week 11	Production and Roles of Intra- and Extracellular Enzymes in Microbial Systems
Week 12	Methods for Extraction and Purification of Microbial Enzymes
Week 13	Assay and Quantitative Analysis of Enzyme Activity
Week 14	Industrial and Biotechnological Applications of Microbial Enzymes
Week 15	Preparatory week before the final Exam
Week 16	The final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1, 2	Laboratory safety, introduction to Enzyme assays and data analysis.
Week 3	Qualitative detection of amylase activity produced by bacterial isolates
Week 4	Quantitative assay of amylase activity produced by bacterial isolates
Week 5,6	Determination of enzyme activity at different substrate concentrations.
Week 7	Effect of temperature on the enzyme activity
Week 8	Effect of pH on the enzyme activity
Week 9,10	Enzyme inhibition using competitive inhibitors
Week 11,12	Enzyme inhibition using non-competitive inhibitors

Week 13,14	Induction of enzyme production in microbial cultures.
Week 15	Enzyme extraction and partial purification by ammonium sulfate precipitation.
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Microbial Enzymes: Classification, Biochemistry, Production and Applications. 2025, Abdel Moneim Elhadi Sulieman, Elsevier Science & Technology Books	No
Recommended Texts	Microbial Enzymes and Biotechniques. 2020, Pratyoo Shukla. Springer Singapore	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Genetic engineering		Module Delivery
Module Type	Support		☒ Theory ☒ Lab ☒ Tutorial ☐ Lecture ☐ Practical ☐ Seminar
Module Code	MBO 31127		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Ahmed A. Mnati		e-mail: mnati@kus.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Asmaa Sami	e-mail	asmaasami@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م. / 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Genetics (MBO 22120)		Semester: 2
Co-requisites module			Semester:

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Introducing students to the various aspects of genetic engineering and its relationship to their specialization, understanding genetic engineering techniques, and studying the possibility of applying these techniques in relation to their field of specialization.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Knowledge of the concept of genetic engineering from the axes of its interests and applications in other sciences. 2- Able to extract the genetic material. 3- Knowing how to measure the purity and concentration of the extracted genetic material. 4- Learn about genetic engineering techniques, including polymerase chain reaction. 5- The ability to make a migration gel for polymerase chain reaction products.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction of genetic engineering. [10 hrs]</u> Introduction and scope of genetic engineering. History of genetic engineering. Applications of genetic engineering in medicine, agriculture, and industry, genetically modified crops, Role of Agrobacterium. <u>Part B – DNA and RNA STRUCTURE, FUNCTION and TYPES [15 hrs]</u> DNA STRUCTURE, FUNCTION, TYPES and MODES OF REPLICATION. RNA STRUCTURE AND TYPES. Transcription and translation. The cell cycle, Mitosis cell division AND Meiotic cell division. <u>Part C – RESTRICTION ENZYMES IN GENETIC ENGINEERING [15 hrs]</u> RESTRICTION NUCLEASES: EXO & ENDO NUCLEASES. Classification of Restriction Endonucleases. Nomenclature. Examples of restriction enzymes. Methylation. Applications. <u>Part D - Host cells and vectors [13 hrs]</u> Introduction of Host cells and vectors. Host cell types: - Prokaryotic hosts and Eukaryotic hosts. Cloning vectors TYPES of Cloning vectors. Plasmids, Cosmids, Bacterial artificial chromosome, Yeast artificial chromosome and Human artificial chromosome. <u>Part E - Gene Transfer [12 hrs]</u> Gene Transfer: - Heat Shock, Electroporation, Viruses, Plant Tumors, Gene Gun, Micro-Injection and Liposomes. Replica Plating. Complementary DNA (cDNA). Basics of DNA Cloning.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in presenting this model is theoretical lectures and encouraging students to participate in the lectures effectively to know the basics of the subject and its vocabulary. Improving thinking skills and encouraging them to participate critically and interactively in the topics raised during the academic weeks in the theoretical and practical parts. This will be achieved through theoretical and practical classes, tutorials, and interactive tutorials by thinking about the type of simple experiments that include some sampling activities that are of interest to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	5, 9	LO # 2, 3, 4, 6, 7 and 8
	Assignments	2	15% (10)	6, 12	LO # 3, 4, 5, 9, 10 and 11
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	14	LO # 10, 11, 12 and 13
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of genetic engineering.
Week 2	History and Applications of genetic engineering.
Week 3	DNA and RNA STRUCTURE, FUNCTION and TYPES part I
Week 4	DNA and RNA STRUCTURE, FUNCTION and TYPES part II
Week 5	RESTRICTION ENZYMES IN GENETIC ENGINEERING part I
Week 6	RESTRICTION ENZYMES IN GENETIC ENGINEERING part II
Week 7	Mid-term Exam.
Week 8	Host cells and vectors part I
Week 9	Host cells and vectors part II
Week 10	Gene Transfer part I
Week 11	Gene Transfer part II
Week 12	Basics of DNA Cloning part I
Week 13	Basics of DNA Cloning part II
Week 14	General Review
Week 15	Preparatory week before the final Exam
Week 16	Final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab1: Laboratory Tools
Week 2	Lab2: Laboratory safety
Week 3	Lab3: Sources of genetic material
Week 4	Lab4: DNA model
Week 5	Lab5: Isolation of DNA part I
Week 6	Lab6: Isolation of DNA part II
Week 7	Lab7: Mid-term Exam.

Week 8	Lab8: Quantification of DNA
Week 9	Lab9: Polymerase chain reaction part I
Week 10	Lab10: Polymerase chain reaction part II
Week 11	Lab11: Agarose gel electrophoresis part I
Week 12	Lab12: Agarose gel electrophoresis part II
Week 13	Lab13: Gel documentation part I
Week 14	Lab14: Gel documentation part II
Week 15	Revision
Week 16	Final Exam.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Genetic Engineering (Dr. Ghaleb Al-Bakry)	No
Recommended Texts	An Introduction to Genetic Engineering. (Third Edition) Desmond S. T. Nicholl University of the West of Scotland, Paisley, UK	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 مادة منهجية البحث العلمي

Module Information			
معلومات المادة الدراسية			
Module Title	منهجية البحث العلمي		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO36037		
ECTS Credits	1		
SWL (hr/sem)	25		
Module Level	3	Semester of Delivery	2
Administering Department	MBIO	College	SCI
Module Leader	Dr. Sraa Nsayef Muslim	e-mail	Sraa.N.Muslim@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Dr. Saad Hussein	e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق.أ.م. / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- بناء العقلية النقدية: تمكين الطالب من نقد الدراسات السابقة وتحديد الفجوات المعرفية بدقة. 2- إتقان أدوات البحث: التدريب على تصميم واستخدام أدوات جمع البيانات (الاستبانات، المقابلات، التجارب). 3- التوظيف التقني: دمج أدوات الذكاء الاصطناعي في تحليل البيانات والبحث عن المصادر بطريقة أخلاقية. 4- الأمانة العلمية: ترسيخ أخلاقيات البحث العلمي وحماية الملكية الفكرية. 5- تعلم كيفية كتابة المصادر وطرق ادراجها ضمن البحث
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	عند انتهاء مفردات المادة الدراسية يكون الطالب متمكناً من: 1- اختيار العنوان وصياغة المشكلة 2- تحديد الأهداف والفرضيات 3- استراتيجيات البحث في قواعد البيانات العالمية 4- كيفية تلخيص ونقد الدراسات السابقة 5- طرق اختيار العينات و تحديد حجم العينة المناسب 6- تجنب الانتحال العلمي 7- كتابة التوصيات والمقترحات النهائية
	تتمحور المحتويات الإرشادية لمنهجية البحث العلمي حول الدمج بين الأساليب التقليدية الرصينة والتقنيات الرقمية الحديثة. كما يلي: 1- الإطار الفلسفي والمفاهيمي • أساسيات البحث العلمي: مفهوم البحث، وسمات الباحث العلمي في عصر المعلوماتية. • أنواع البحوث: الفرق بين البحوث الكمية، والنوعية، والبحوث المختلطة [2 hrs] • أخلاقيات البحث: التعامل مع المشاركين البشر، خصوصية البيانات، والمعايير الأخلاقية لاستخدام الذكاء الاصطناعي في الكتابة العلمية [2 hrs].

Indicative Contents المحتويات الإرشادية	2- مرحلة التخطيط والبناء (خطة البحث) • تحديد مشكلة البحث :كيفية صياغة مشكلة بحثية ذات قيمة علمية وعملية وكذلك الأهداف والفرضيات :صياغة أهداف ذكية (SMART) ووضع فرضيات قابلة للاختبار . [2 hrs] • الدراسات السابقة :طرق البحث في قواعد البيانات العالمية (مثل Scopus و Web of Science)وكيفية نقد وتحليل الأدبيات السابقة[2 hrs] . 3.اختيار المنهجية والأدوات • تصميم البحث :اختيار المنهج الأنسب (تجريبي، وصفي، تحليل محتوى، دراسة حالة) . [2 hrs] •اختيار عينة البحث :أساليب اختيار العينات الرقمية والميدانية، وتحديد حجم العينة المناسب إحصائياً[2 hrs] . • أدوات جمع البيانات :تصميم الاستبيانات الإلكترونية، المقابلات (عبر الإنترنت أو حضورياً)، الملاحظة، والاختبارات[2 hrs] . 4- الكتابة الأكاديمية والتوثيق هيكلية البحث :الالتزام بنموذج (IMRaD) العالمي (مقدمة، طرائق العمل، نتائج، مناقشة).[2 hrs] الأسلوب العلمي :الكتابة بوضوح ودقة وتجنب الحشو[2 hrs] . التوثيق والاقتباس :التدريب على أنظمة التوثيق الحديثة (مثل APA الإصدار السابع أو الثامن المتوقع لعام 2026) واستخدام برامج إدارة المراجع مثل Mendeley.[2 hrs]
Indicative Contents المحتويات الإرشادية	.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- التعلم القائم على المشروعات: (Project-Based Learning) بدلاً من الامتحانات التقليدية، يُكلف الطلاب بإعداد "خطة بحثية متكاملة" أو "ورقة بحثية مصغرة" طوال الفصل الدراسي، حيث يتم تطبيق كل محاضرة نظرياً على مشروعاتهم الخاص فوراً.
	2- الفصل المقلوب: (Flipped Classroom) يشاهد الطلاب الشروحات النظرية (فيديوهات أو قراءات) قبل الحاضرة، ويُخصص وقت اللقاء في القاعة الدراسية للمناقشات النقدية، وتحليل عينات من بحوث حقيقية، وتصحيح الأخطاء الشائعة.
	3- برمجيات إدارة المراجع: التدريب العملي المكثف على (EndNote) لضمان التوثيق الآلي الصحيح.
	الهدف النهائي من هذه الاستراتيجيات: هو تحويل مادة المنهجية من مادة "جافة" إلى مهارة حياتية وأكاديمية تمكن الطالب من التفكير بمنطق علمي في حل المشكلات.

د

Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	20	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	5	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	1.3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	25		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	5% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	20% (20)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	المقدمة
Week 2	ما الهدف من البحث التخرج وما هو المقال العلمي
Week 3	انواع مصادر المعلومات في البحث العلمي
Week 4	طرق كتابة اقسام المقالة البحثية (العنوان- المؤلفون)
Week 5	الخلاصة والمقدمة
Week 6	المولد وطرائق العمل
Week 7	Mid-term Exam
Week 8	النتائج
Week 9	مناقشة -التوصيات
Week 10	المصادر
Week 11	الانتحال العلمي
Week 12	ماهو انواع الانتحال العلمي
Week 13	اسباب الانتحال
Week 14-15	ستراتيجيات تجنب الانتحال العلمي
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Texts	Available in the Library?
Required Texts	كتاب "مناهج البحث العلمي" - د. أحمد بدر	كلا
Recommended Texts	كتاب "البحث العلمي: مفهومه، أدواته، أساليبه" - د. ذوقان عبيدات وآخرون	كلا
Websites	منصة "المنظومة (EduSearch)"	

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	Clinical Immunity		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 42143		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Mustafa Abdul Hussein Abdul Ameer	e-mail	Mustafa.a@kus.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Saad Hussein Khudhair	e-mail	Saad2019@kus.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق/أ.م/ 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Immunology (MBO31028)	Semester	1
Co-requisites module	Non	Semester	-

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Definition of autoimmune diseases and hypersensitivity diseases 2. Divided the types of autoimmune diseases based on the affected organs, and classify the disease based on the severity of the condition. 3. To identified the general techniques used in the diagnosis of disease
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the basic concepts of Autoimmune diseases . 2. Describe the relationship of normal immune response and abnormal immune response . 3. Study all the types of autoimmune diseases . 4. Study of laboratory diagnosis and identification of autoimmune diseases .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Learn about rheumatism and arthritis. [14 hrs]</u> <u>Part B – Identify the diseases of the digestive system caused by autoimmunity. [14 hrs]</u> Revision problem classes [6 hrs] <u>Part C – Recognizing diseases of immune renal failure. [14 hrs]</u> <u>Part D – Identify the immune diseases that affect the endocrine glands. [13 hrs]</u> <u>Part E – Identifying immune diseases that affect the lung. [14 hrs]</u>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is: - Theoretical lectures and conducting practical experiments to understand and comprehend the Autoimmune diseases . - Define student groups to discuss various topics related to clinical immunology by setting electronic hours for discussion. - Presentation of a seminar by each student at the end of the semester within one of the topics related to the Autoimmune diseases .
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	4, 8	LO #1, 2, 3, 5,6, and 7
	Assignments	2	15% (15)	5, 10	LO # 2, 4, 6, 8, and 9
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Rheumatoid arthritis
Week 2	Systemic Lupus Erythematosus
Week 3	Ankylosing spondylitis
Week 4	Sjögren's Syndrome and Behçet Disease
Week 5	Gastrointestinal and liver diseases:- Gluten-Sensitive Enteropathy
Week 6	Pernicious Anemia
Week 7	Mid-term Exam

Week 8	Endocrinology and Diabetes
Week 9	Diabetes mellitus
Week 10	Immune hemolytic anemia
Week 11	Kidney disease:- Renal immune disorders
Week 12	Acute glomerulonephritis
Week 13	Respiratory and allergy
Week 14	Drug-induced pulmonary disease
Week 15	A preparatory week before final exam
Week 16	Final -term Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Enzyme Linked Immunosorbent Assay (ELISA) technique
Week 2	Lab 2: Human Leucocyte Antigen (HLA) Typing
Week 3	Lab 3: Methods to identify hypersensitivity reactions
Week 4	Lab 4: Immunoelectrophoresis
Week 5	Lab 5: Immunoglobulins (Ig.) and purification methods
Week 6	Lab 6: Hemagglutination reaction.
Week 7	Mid Exam
Week 8	Lab 7: Diagnosis of RA
Week 9	Lab 8: Lab Diagnosis of Systemic Lupus Erythematosus
Week 10	Lab 9: Lab Diagnosis of Ankylosing spondylitis
Week 11	Lab 10: Lab Diagnosis of Sjögren's Syndrome
Week 12	Lab 11: Lab Diagnosis of Behçet Disease
Week 13	Lab 12: Lab Diagnosis of Gluten-Sensitive Enteropathy
Week 14	Lab 13: Lab Diagnosis of Pernicious Anemia.
Week 15	A preparatory week before final exam
Week 16	Final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Essentials of Clinical Immunology , Helen Chapel . Forth Edition	No
Recommended Texts	JANEWAY'S Immunobiology Kenneth Murphy Washington University School of Medicine, St. Louis	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	Job Ethics		Module Delivery
Module Type	Basic		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO41042		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	4	Semester of Delivery	
Administering Department	MBO	College	SC
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Mustafa Abdul Hussein Abdul Ameer	e-mail	Mustafa.a@kus.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق/أ.م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Application of academic programs Al-karkh University of sciences. 2. To understand the principles of the work ethics. 3. This course deals with the basic concept of job ethics. 4. Providing students with sound thinking methods (deductive thinking, scientific thinking, critical thinking, creative thinking,) 5. Graduating specialists in the field of different sciences with the highest efficiency to deal with job problems and decision making.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand and define the concepts of integrity and ethics. 2. Understand how to resolve ethical dilemmas. 3. Describe three major theoretical approaches in integrity and ethics. 4. Identify ethical dilemmas and apply different theoretical approaches. 5. Understand the concept of personal integrity in the context of this Module. 6. Understand how to apply social work ethics to professional decision-making.
Indicative Contents المحتويات الإرشادية	Module 1: Introduction and Conceptual Framework Throughout the Module, students will be introduced to concepts and thrown in at the deep end by being asked to make decisions on what they would regard as the most ethical solutions to dilemmas. Students will be guided through three major ethical theories and challenged to agree or disagree with them. Students should not be afraid to take a stance, as this will enhance their learning and enjoyment of the Module. (1hr) Module 2: Ethics and Universal Values This Module explores the existence of universal human values, which are those things or behaviours that we believe should be privileged and promoted in the lives of all human beings. (2hrs) Module 3: Ethics and Society This Module explores the importance of ethics to society and the relationship between these two concepts. (1hr) Module 4: Ethical Leadership We live in a world in which individuals, organizations, countries and societies are increasingly connected. Therefore, the impact of leadership - both good and bad - reverberates throughout entire political and economic systems. (1hr) Module 5: Ethics, Diversity and Pluralism This Module explores the concepts of diversity, tolerance and pluralism. It examines ways in which the acceptance of diversity may be challenging but can be understood and accomplished by drawing on ideas and examples of ethical behaviour. (2hrs) Module 6: Challenges to Ethical Living

	The Module seeks to help students understand some of the psychological mechanisms that can lead one towards unethical behaviour in certain circumstances. (1hr) Module 7: Strategies for Ethical Action This Module introduces practical strategies for taking ethical action in the workplace (in the public or private sectors), university, community and in life more broadly. (2hrs) Module 8: Behavioural Ethics Evidence from behavioural science research has shown that people are less consistent and less rational in their decisions than they would like to admit to themselves. (2hrs) Module 9: Gender Dimensions of Ethics This Module introduces the gender dimensions of ethics. (1hr) Module 10: Media Integrity and Ethics This Module discusses the relationship between the concepts of ethics and media. It aims to facilitate introspective reflection on the ways in which all of us, as individuals, play a part in the creation and dissemination of media. (2hrs) Module 11: Business Integrity and Ethics This Module introduces students to the idea that integrity and ethics are key to sustainable business success. It examines the reasons why individuals in corporate entities should act with integrity and do business ethically. (2hrs) Module 12: Integrity, Ethics and Law Why is it that some actions are legal but not ethical, or ethical but not legal? This Module is designed to be used by lecturers in a variety of disciplines who wish to introduce their students to the ideas of integrity, ethics and law, including what these concepts stand for and how they are different. (1hr) Module 13: Public Integrity and Ethics This Module examines methods and approaches to strengthening integrity in the public sector. (1hr) Module 14: Professional Ethics Should a journalist publish very private information about someone to inform the public about an issue? Should a lawyer withhold confidential client information that would save someone's life? This Module is designed to introduce students to the nature, practices and importance of professional ethics. (1hr)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Clearly distinguish between personal, theoretical and professional ethic. 2. Think critically about ethical issues, which are encountered first hand within a career, and apply personal, theoretical, and professional ethics to vexing moral decisions within specific professions. 3. Grasp the challenges posed by potential conflicts between role morality and personal morality, and consider ways of resolving those conflicts. 4. Understand the role of professional codes of ethics, the difference between aspirational and disciplinary codes of ethics, and how professional codes may apply in their career.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1,3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments		(0)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0% (0)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1 hr	20% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Module 1: Introduction and Conceptual Framework
Week 2	Module 2: Ethics and Universal Values
Week 3	Module 3: Ethics and Society
Week 4	Module 4: Ethical Leadership
Week 5	Module 5: Ethics, Diversity and Pluralism
Week 6	Module 6: Challenges to Ethical Living
Week 7	Module 7: Strategies for Ethical Action
Week 8	Module 8: Behavioural Ethics
Week 9	Module 9: Gender Dimensions of Ethics
Week 10	Module 10: Media Integrity and Ethics
Week 11	Module 11: Business Integrity and Ethics
Week 12	Module 12: Integrity, Ethics and Law
Week 13	Module 13: Public Integrity and Ethics
Week 14	Module 14: Professional Ethics
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Business Ethics Activity Book by Dr. Marlene Caroselli Released September 2003 Publisher(s): AMACOM ISBN: 9780814413203	No
Recommended Texts	The Work Ethic: Working Values and Values That Work	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	Pathogenic Virology		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☒ Practical ☐ Seminar
Module Code	MBO41140		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Hiba Shakir Ahmed	e-mail	hiba.sh@kus.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	-
Peer Reviewer Name	Dr.Asmaa Sami	e-mail	asmaasami@kus.edu.iq
Scientific Committee Approval Date	18/6/2023	Version Number	ق.أ.م / 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Virology (MBO 21017)	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- The student recognizes the types of viruses that cause humans and their classification. 2- Know the viral vaccines and serums. 3- The student will be familiar with the most important clinical symptoms and the mechanism of disease occurrence. 4- The student studies methods of diagnosing viruses using electron microscopy, polymerase chain reaction technique, and methods of identifying them. 5- Know the most important ways to prevent viral infections.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing students to laboratory skills and their relationship to the applicable health system 2. Providing students with the knowledge to conduct appropriate studies to know the most important pathogenic virus that society suffers from, their causes, how to distribute diseases and the impact of various factors on them, and to know the most appropriate ways to solve these problems. 3. Seeking to prepare scientists and researchers with medical laboratory skills of a research nature. 4. Interacting with scientific and technical experiences and expertise in a way that serves the community. 5. Providing students with the basic skills to conduct various medical studies 6. Provide students with sufficient cognitive skills to know the causes of microbial diseases and how to prevent them.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – The Introduction to virology</u> The Structure and function definitions, study the general Properties of Viruses with Classification of viruses and study Atypical Virus Like Particles . Pathogenesis of virus – study the Steps in Viral Pathogenesis from entry and Primary Replication to the Virus Shedding and study Viral Virulence with Measuring Viral Virulence. Replication of virus in two types (DNA and RNA virus) with recognize The effect of viral replication on host cell. Control of viral infections that include the Host defenses , Antiviral chemotherapy and vaccinations and study the Orthomyxoviruses (Influenza viruses) major determinant of morbidity and mortality caused by respiratory disease and outbreaks of infection and study the Clinical Finding with Laboratory Diagnosis . [34 hrs]

	Revision problem classes [7 hrs] <u>Part B – fundamentals</u> Paramyxoviruses & Rubella virus properties and Clinical Finding with Laboratory Diagnosis. Enteroviruses are transient inhabitant of the human alimentary tract with recognize Poliomyelitis clinical finding , Herpes virus and cytomegalovirus properties and clinical finding with laboratory diagnosis. Oncoviruses study the viruses that have been strongly associated with human cancers, recognize the Hepatitis viruses and RABIES & OTHER NEUROTROPIC VIRUSES and HIV virus and ADENOVIRUSES clinical symptoms and diagnosis methods. [34 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	4, 8	LO #1, 2, 3,5,6 and 7
	Assignments	2	10% (10)	5, 10	LO #2, 4, 6 ,8 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to virology
Week 2	Pathogenesis of viruses
Week 3	Replication of viruses
Week 4	Control of viral infections
Week 5	Other Types of Antiviral Agents
Week 6	Orthomyxoviruses (Influenza viruses)
Week 7	Mid-term Exam
Week 8	Paramyxoviruses & Rubella virus
Week 9	Enteric viruses & Rhinoviruses
Week 10	Herpes Viruses
Week 11	Oncoviruses
Week 12	Hepatitis viruses
Week 13	RABIES & OTHER NEUROTROPIC VIRUSES
Week 14	HUMAN IMMUNODEFICIENCY VIRUS
Week 15	ADENOVIRUSES
Week 16	The final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- Medical Virology(4th ed.). Fenner and White, 1996 - Principles and Practice of Clinical Virology, 5th ed. Zukerman et al	No
Recommended Texts	Human Virology. PSG. Publishing Com. INC. -MatThews, R.E.F. (1981). Plant Virology. 2nd Edition. Academic Press. Levine, A.J. (1992). Viruses. Scientific American Library. - Belshe, R.B. (1984).	No
Websites	https://scholar.google.com/	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Applied Pathological Analysis		Module Delivery
Module Type	Core		Theory × Lecture × Lab ☐ Tutorial ☐ Practical × Seminar
Module Code	MBO42046		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	2
Administering Department	MBO	College	Sc
Module Leader	Rafeef Yousif	e-mail	Rafeef.rashid@kus.edu.iq
Module Leader's Acad. Title	Lecturer Doctor	Module Leader's Qualification	Ph.D.
Module Tutor	-----	e-mail	-----
Peer Reviewer Name	Dr.Asmaa Sami	e-mail	asmaasami@kus.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	ق.أ.م / 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Recognize the steps of Biosafety in medical laboratories. 2- Recognize the most common and chronic diseases and there treatment. 3- Identify the continents of the medical laboratories papers 4- Learn reading and working of medical kits leaflets. 5- Learn the dealing with the medical devices and materials in medical laboratories. 6- Learn the methods of blood collection and types of blood tubes. 7- Describe the ethics of dealing with patients and giving the analysis results. 8- Diagnoses of diseases by medical analysis in laboratories. 9- Recognize the alternative methods to diagnose diseases in laboratories. 10- Learn the Quality control of medical laboratories kits. 11- Identify the conditions and causes of medical analysis. 12- Differentiation between all types of medical analysis. 13- Learn the procedures of the most common analysis of all human body organs. 14- Diagnoses of human cancers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Medical laboratories Sciences, department , purposes, procedures and biosafety rules. 2- Anticoagulants substances, phlebotomy, Vacutainer system, specimen rejection, preservation of samples and complications of blood sampling. 3- Functions and structure of blood components, complete blood picture . 4- Events of coagulation profile , coagulation factors, Bleeding time and Clotting time. 5- Management, Factors, sources and procedures of laboratories Quality control. 6- Definitions , functions, mechanism of actions, regulation and analysis of all types of lipid profile with normal values. 7- Identify types of diabetes profile and differentiation methods between these types with diagnosis and normal values. 8- Identify human renal system parts and there functions and who to diagnoses functions with normal values. 9- Identify human liver parts and there functions and who to diagnoses functions with normal values. 10- Jaundice profile with causes , types and diagnoses of these types. 11- Definition, functions , types and diagnosis of cytokines . 12- Definition, functions , types and diagnosis of tumor markers . 13- Definition Complete stool analysis and learning causes, parts, procedures steps and diagnosis. 14- Definition Complete urine analysis and learning causes, parts, procedures steps and diagnosis. 15- Definition Complete Seminal analysis and learning causes, parts, procedures steps and diagnosis.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction to pathological analysis</u> Biosafety procedures- Protection from infections in the laboratories- Sterilization methods- Laboratories Ethics with patients – Identification of medical devices and materials - Organization of steps in laboratories. (21 hrs) Revision problem classes. [6 hrs.] <u>Part B – Fundamentals and information's</u> -Definitions , Types, Causes , principles, Importance, Procedures methods, Normal values, Results, discussion of results for all pathological analysis in medical laboratories. (28 hrs) - Studying all human body organs which affected by medical analysis and its results and how can protection these organs from abnormality analysis results. (20 hrs)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the steps of analysis in the laboratories , while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. Another strategy for learning by giving examples from the life to remain in the students memory.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4,8	LO #1, 2, 3 ,5,6 and 7
	Assignments	2	10% (10)	5,10	LO # 3, 4, 6 ,8 and 9
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to pathological analysis and medical laboratories
Week 2	Anticoagulants substances
Week 3	Functions and structure of blood components
Week 4	Coagulation profile
Week 5	Quality control
Week 6	Lipid profile
Week 7	Diabetes profile
Week 8	Mid-term Exam
Week 9	Renal functions
Week 10	Liver functions
Week 11	Jaundice profile
Week 12	Cytokines
Week 13	Tumor markers
Week 14	Complete stool analysis
Week 15	Complete urine analysis, Complete Seminal analysis
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Lab 1,2: Biosafety procedures , types of laboratories tubes and blood collection methods
Week 3,4	Lab 3,4: Quality control , bleeding time and clotting time tests
Week 5,6	Lab 5,6: Diabetes profile and Lipid profile tests
Week 7,8	Lab 7,8: Renal functions tests
Week 9,10	Lab 9,10: Liver functions and Jaundice profile tests
Week 11,12	Lab 11,12: Complete stool analysis
Week 13,14	Lab 13,14: Complete urine analysis
Week 15	A preparatory week before final exam
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Pathological Investigation with Analysis [Jan 01, 2013] Dashora, M.M	No
Recommended Texts	Al-Wajeez in pathological analysis by Ali abd al-Hussain Mahdi (2008)	yes
Websites	https://www.pathological_analysis.org/pathoogical science	

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	Clinical Chemistry		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 41137		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	1
Administering Department	MBO	College	SC
Module Leader	Dr. Saad Hussein Khudhair		e-mail
Module Leader's Acad. Title		Assistant Professor	Module Leader's Qualification
Module Tutor		-----	e-mail
Peer Reviewer Name		Mustafa Abdul Hussein Abdul Ameer	e-mail
Scientific Committee Approval Date		18/6/2023	Version Number
			ق.أ.م. / 508

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Biochemistry (MBO 22121)	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Give basic concepts of clinical chemistry to identify and quantify a variety of analyses in blood and bodily fluids using analytical techniques. 2- Give an understanding of the functions of cells, tissues, and organs. 3- Explain the structure, properties, and roles of body liquids in biological systems. 4- The module also gives insight into the importance of foods and body wastes. 5- Through problem sets, exams, and quizzes in this module the students will demonstrate the ability to engage in scientific as well as quantitative and qualitative reasoning. 6- Students will also demonstrate the ability to communicate science in writing. 7- Complete the reports, seminars, and presentations to develop the student's skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will acquire the following knowledge and skill: 1- Identity biochemical function tests useful in Diagnosis, Monitoring response to therapy, prognosis, and screening 2- Define, interpret, or apply biochemical terminology as it relates to disease state and metabolic functions 3- Interpret the clinical significance of biochemical lab test results 4- Cognitive skills to be developed by enabling the student to Explain the molecular basis of diseases and Relate the signs and symptoms to the molecular basis of diseases. This will be achieved through solving case studies. 5- Give students communication skills by developing teamwork and helping them to improve their communication skills
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A - Introduction to clinical chemistry</u> Organization of clinical laboratory, Introduction to instrumentation and automation in clinical biochemistry laboratories safety regulations and first aid. General comments on specimen collection, and types of specimens for biochemical analysis. Precision, accuracy, quality control, precautions, and limitations. [16 hrs] <u>Part B - Diseases related to carbohydrate metabolism</u> Introduction - Normal, fasting and postprandial level, Regulation of blood sugar, Glycosuria - types of glycosuria. Oral glucose tolerance test in normal and diabetic conditions. Diabetes mellitus and Diabetes insipidus - hypoglycemia, hyperglycemia. [17 hrs] Revision problem classes. [8 hrs] <u>Part C - Diseases related to lipid and lipoproteins metabolism</u> Introduction, Lipids and lipoproteins: Classification, composition, mode of action, hyper triacylglyceridemia, hypo, and hyperlipoproteinemia. Cholesterol - Factors affecting blood cholesterol level. [11 hrs]

	<u>Part D – Diseases in protein metabolism:</u> Introduction - Clinical significance and variation of plasma and serum protein; Clinical features of phenylketonuria, alkaptonuria, albinism, and tyrosinosis; Disorders in the urea cycle. [9 hrs] <u>Part E – Clinical significance of non-protein nitrogen</u> urea, uric acid, and creatinine - Normal and abnormal levels; clinical importance of clearance determination. [5 hrs] <u>Part F – Organs Functions</u> Detoxification and excretory functions, protein changes in liver disease; Differential diagnosis of Jaundice. Fractional test meal analysis and its interpretation; GI hormones: gastrin, secretin, CCK, and gastric inhibitory peptide. [9 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Many strategies will be used in this module to encourage students to learn and develop their skills in Clinical chemistry such as participation in the exercises, seminars, lab experiments, and workshops related to the field of sample collection, sample preparation, testing, and diagnosis of disordered, as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, interactive tutorials, and simple laboratory experiments that involve some activities of sampling, examining, and testing biological samples in ways that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	75	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	5% (5)	3, 6, 9	LO # 1-9
	Assignments	3	10% (10)	4, 8, 12	LO # 1-12
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to clinical biochemistry I
Week 2	Introduction to clinical biochemistry II
Week 3	Introduction to clinical biochemistry III
Week 4	Diseases related to carbohydrate metabolism I
Week 5	Diseases related to carbohydrate metabolism II
Week 6	Diseases related to carbohydrate metabolism III
Week 7	Mid-term Exam
Week 8	Diseases related to lipid and lipoproteins metabolism I
Week 9	Diseases related to lipid and lipoproteins metabolism II
Week 10	Diseases related to lipid and lipoproteins metabolism III
Week 11	Diseases related to protein metabolism I
Week 12	Diseases related to protein metabolism II
Week 13	Clinical significance of non-protein nitrogen
Week 14	Liver function tests
Week 15	Gastric function test
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Blood glucose analysis
Week 2	Lab 2: Blood urea analysis.
Week 3	Lab 3: Serum creatinine estimation.
Week 4,5	Lab 4,5: Serum uric acid estimation.
Week 6	Lab 6: Serum cholesterol estimation. 1
Week 7,8	Lab 7,8: Serum bilirubin estimation.
Week 9,10	Lab 9,10: Estimation of total protein.
Week 11,12	Lab 11,12: Determination of A/G ratio.
Week 13,14	Lab 13,14: Urine analysis.
Week 15	A preparatory week before final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Clinical Chemistry: William J. Marshall and Stephen K. Bangert, Mosby, 2012, 7th edition	No
Recommended Texts	Clinical Biochemistry : Lecture notes, by Geoffery Beckett, Simon Walker, Peter Rae, Peter Ashby, Blackwell publishing, 7th edition, 2005, ISBN, 978-1-4051-2959-6	No
Websites	https://scholar.google.com/	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Serology and Vaccines		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 41038		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level		Semester of Delivery	
Administering Department	MBIO	College	1
Module Leader	Dr. Zainab Thamer Showait	e-mail	ztsayye@kus.edu.iq
Module Leader's Acad. Title	Asst. professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail: Mustafa.a@kus.edu.iq
Peer Reviewer Name	stafa Abdul Hussein Abdul Ameer	e-mail	
Scientific Committee Approval Date	18/06/2023	Version Number	ق/أ. م/ 508

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course aims to study antibodies and their interaction with antigens in body fluids. And measuring the immune reaction through the production of antibodies (substances) that protect the body from bacterial or viral antigens that cause various diseases by identifying the types of interactions and serological tests and their diagnostic applications. It also aims to identify vaccines, their function, types, and stages of manufacturing different vaccines.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-The student understands the basic concepts of serology and vaccines 2- To describe the relationship between the basic concepts of serology in general form. 3- Cognitive analysis of the importance of vaccines and their relationship to various diseases. 4- To evaluate, apply and work for the applied side. 5- Providing the student with information about the most important tests based on the interaction between antibody and antigen.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A-Serology :</u> Introduction in serology, serological reaction , terms in serology ,application of serological test , antigen tests ,antibody tests (10 hrs.) <u>Part B –Immunological techniques :</u>

	Primary immunological test , secondary I.T. ,tertiary I.T. ,primary and secondary immune response , differences between primary I.R. and secondary I.R. , antibody production . monoclonal antibodies , polyclonal antibodies , antibodies cross-reactivity(10 hrs.) <u>Part C-Types of antibody – antigen reaction(Agglutination):</u> Principle of agglutination test, active agglutination slide test , passive agglutination slide test , tube agglutination test , prozone effect , indirect (passive) Hem-agglutination test , Hem-agglutination inhibition antibody test , reverse passive agglutination (10 hrs.). Revision problem classes. (3 hrs.). <u>Part D-Precipitation test:</u> Principles of precipitin test , tube precipitin test , gel diffusion , double gel diffusion , radial immune-diffusion (single) , Immune-electrophoresis , rocket electrophoresis (10 hrs.) <u>Part E-Immuno-assay:</u> ELISA (principle) , types of ELISA , reading ELISA results , Radio immune-assay (principles) , reading RIA results , applications , rapid test (principle) , TORCH test (10 hrs.) <u>Part F-Vaccines :</u> Definition vaccination and vaccine , history of vaccine development , types of vaccines , how vaccines work , routs of administrations , adverse events following vaccination , component of vaccine (10 hrs.) <u>Part G-Vaccines trials:</u> Vaccines process or development , vaccines side effects , common side effects , serious side effects , vaccination and the risk of atopy , covid-19 vaccines types and efficacy(10 hrs.)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Many strategies will be used in this module to encourage students to learn and develop their skills in serological tests such as participation in the exercises, seminars, lab experiments, and workshops related to the field of isolation, purification, and diagnosis of different diseases , as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, Interactive tutorials, and simple laboratory experiments that involve some activities of sampling, examining, and dealing with instruments and devices .
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction – Definition of serology ,active and passive immunity , terms used to evaluate the serological reaction .
Week 2	application of serological test , antigen –antibody reactions , types of serological test.
Week 3	Primary immunological test , secondary I.T. ,tertiary I.T. ,primary and secondary immune response , differences between primary I.R. and secondary I.R.
Week 4	antibody production . monoclonal antibodies , polyclonal antibodies , antibodies cross-reactivity.
Week 5	Principle of agglutination test, active agglutination slide test , passive agglutination slide test , tube agglutination test.
Week 6	prozone effect , indirect (passive) Hem-agglutination test , Hem-agglutination inhibition antibody test , reverse passive agglutination.
Week 7	Mid-term Exam
Week 8	Principles of precipitin test , tube precipitin test , gel diffusion , double gel diffusion , radial immune-diffusion (single).
Week 9	Immune-electrophoresis , rocket electrophoresis , complement fixation test.
Week 10	ELISA (principle) , types of ELISA , reading ELISA results , applications.
Week 11	, Radio immune-assay (principles) , reading RIA results , applications

Week 12	rapid test (principle) , TORCH test .
Week 13	Definition vaccination and vaccine , history of vaccine development , types of vaccines routes of administrations , adverse events following vaccination , component of vaccine .
Week 14	Vaccines process or development , vaccines side effects , common side effects , serious side effects , vaccination and the risk of atopy.
Week 15	covid-19 vaccines types and efficacy.
Week 16	A preparatory week before the final exam .

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1 ,2	serum and plasma separation , Types of specimens .
Week 3 , 4	Determination of AB titer , Types of micropipettes
Week 5	complement fixation test .
Week 6	Discussion
Week 7 , 8	Determination of the IgM protein, by radial immunodiffusion plate , single immunodiffusion
Week 9	Discussion
Week 10	Application of ELISA technique
Week 11	Lab7:rapid test (covid-19)test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Immunology and serology in laboratory medicine.	no
Recommended Texts	The immunological basis for immunization series.	no
Websites	https://fhs.mcmaster.ca/healthscreening/documents/HepatitisBImmunizationandSerologyInformation.pdf	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Antibiotics		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 47042		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	2
Administering Department	MBO	College	SC
Module Leader	Dr. Rawa Abdul Redha Aziz		e-mail
Module Leader's Acad. Title		Assistant Professor	Module Leader's Qualification
Module Tutor		-----	e-mail
Peer Reviewer Name		-----	e-mail
Scientific Committee Approval Date		-----	Version Number

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- By the end of this course, students should be able to: 2- Define antibiotics and explain their importance in the treatment of bacterial infections. 3- Classify antibiotics according to their chemical structure and mechanisms of action. 4- Explain the major mechanisms by which antibiotics inhibit or kill bacterial cells. 5- Differentiate between bacteriostatic and bactericidal antibiotics. 6- Explain the factors affecting antibiotic activity. 7- Describe the major mechanisms of bacterial resistance to antibiotics. 8- Explain the genetic and molecular basis of antimicrobial resistance. 9- Describe the role of mutations and horizontal gene transfer in the development and dissemination of resistance. 10- Explain the mechanisms of multidrug resistance in bacteria. 11- Perform and interpret antibiotic susceptibility testing. 12- Determine MIC and MBC using appropriate laboratory methods. 13- Interpret bacterial susceptibility and resistance patterns. 14- Explain the importance of rational antibiotic use and antimicrobial stewardship. 15- Apply appropriate laboratory safety procedures when handling bacterial isolates and antibiotics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At the end of the course, students will be able to: A. Knowledge and Understanding • Explain the major classes of antibiotics. • Describe their mechanisms of action. • Explain the cellular and molecular mechanisms of bacterial resistance. • Understand the genetic basis and dissemination of antibiotic resistance. B. Practical Skills • Perform antibiotic susceptibility testing. • Prepare standardized bacterial inocula. • Apply the disk diffusion method. • Measure and interpret inhibition zones. • Determine MIC and MBC using appropriate laboratory procedures. C. Scientific and Analytical Skills • Analyze antibiotic susceptibility results. • Identify bacterial resistance patterns. • Relate laboratory findings to the underlying mechanisms of resistance. • Interpret scientific data accurately. D. Communication Skills • Prepare scientific laboratory reports. • Present and discuss experimental results. • Use appropriate microbiological and molecular terminology.
Indicative Contents المحتويات الإرشادية	This course is designed to provide fourth-stage Microbiology students with an integrated theoretical and practical understanding of antibiotics. It emphasizes antibiotic classification, mechanisms of action, bacterial resistance, molecular mechanisms of resistance, antimicrobial susceptibility testing, multidrug resistance, and rational antibiotic use. The practical component reinforces theoretical knowledge through laboratory-based assessment of antibiotic activity and bacterial susceptibility patterns.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The Antibiotic course employs a variety of teaching and learning strategies designed to achieve both theoretical understanding and practical competency among students. Interactive lectures are used to explain fundamental concepts and relate them to clinical applications. Problem-based learning approaches are incorporated through the presentation of clinical cases, such as diabetes mellitus and liver diseases, to stimulate students' critical thinking and analytical skills. Practical
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	laboratory sessions are conducted to develop technical skills in performing laboratory analyses and interpreting results, supported by demonstrations of modern laboratory instruments and analytical techniques. The course also utilizes collaborative learning through group work and classroom discussions to promote knowledge exchange and active participation. In addition, e-learning strategies are implemented using digital platforms and multimedia resources to enhance the learning experience. Case-based learning is employed to connect laboratory findings with real clinical scenarios, thereby fostering analytical reasoning and decision-making skills. These approaches are complemented by continuous assessment and constructive feedback to facilitate the gradual improvement of students' knowledge, practical abilities, and professional competencies.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	Weeks 3, 6, 9	L # 1-9
	Assignments	2	10% (10)	Week 3	L # 1-12
	Projects / Lab.	1	10% (10)	Continuous	All Practical
	Report	1	10% (10)	Weeks 5-12	L # 12
Summative assessment	Midterm Exam	2 hr	10% (10)	Week 7	L # 1-6
	Final Exam	2hr	50% (50)	Week 16	All Outcomes
Total assessment			100% (100 Marks)		100% (100 Marks)

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Antibiotics • Definition of antibiotics and antimicrobial agents. • Historical development of antibiotics. • Importance of antibiotics in microbiology and medicine. • Sources of antibiotics. • General characteristics of antimicrobial agents.
Week 2	Classification of Antibiotics • Classification according to mechanism of action. • Classification according to chemical structure. • Classification according to antimicrobial spectrum. • Narrow-spectrum and broad-spectrum antibiotics.
Week 3	Cell Wall Synthesis Inhibitors • β-Lactam antibiotics. • Penicillins. • Cephalosporins. • Carbapenems. • Monobactams. • Glycopeptides. • Mechanisms of resistance to cell wall inhibitors.
Week 4	Protein Synthesis Inhibitors • Aminoglycosides. • Tetracyclines. • Macrolides. • Lincosamides. • Oxazolidinones. • Mechanisms of action and bacterial resistance.
Week 5	Nucleic Acid Synthesis Inhibitors • Quinolones and fluoroquinolones. • Rifamycins. • Inhibition of DNA replication. • Inhibition of RNA synthesis. • Mechanisms of resistance.
Week 6	Metabolic Pathway Inhibitors • Sulfonamides. • Trimethoprim. • Inhibition of folic acid synthesis. • Mechanisms of bacterial resistance.
Week 7	Other Antimicrobial Agents • Polymyxins. • Chloramphenicol. • Nitrofurantoin. • Metronidazole. • Mechanisms of action and resistance.
Week 8	Mechanisms of Antibiotic Action • Inhibition of cell wall synthesis. • Inhibition of protein synthesis. • Inhibition of nucleic acid synthesis. • Inhibition of metabolic pathways.

	• Disruption of bacterial cell membranes.
Week 9	Bacterial Resistance to Antibiotics • Definition of antimicrobial resistance. • Intrinsic resistance. • Acquired resistance. • Mutational resistance. • Horizontal transmission of resistance.
Week 10	Molecular Mechanisms of Antibiotic Resistance • Enzymatic inactivation of antibiotics. • Modification of antibiotic targets. • Alteration of target sites. • Reduced bacterial permeability. • Efflux pump mechanisms. • Antibiotic resistance genes.
Week 11	Horizontal Gene Transfer and Resistance • Plasmids. • Transposons. • Integrations. • Conjugation. • Transformation. • Transduction. • Dissemination of antibiotic resistance genes.
Week 12	Multidrug-Resistant Bacteria • Definition of MDR, XDR, and PDR. • Mechanisms of multidrug resistance. • Factors contributing to the emergence of resistant bacteria. • Epidemiological importance of antimicrobial resistance.
Week 13	Antibiotic Susceptibility Testing • Principles of antimicrobial susceptibility testing. • Disk diffusion method. • Minimum inhibitory concentration (MIC). • Minimum bactericidal concentration (MBC). • Interpretation of susceptibility testing results.
Week 14	Rational Use of Antibiotics • Appropriate antibiotic selection. • Antibiotic misuse and overuse. • Consequences of inappropriate antibiotic therapy. • Antimicrobial stewardship. • Strategies for reducing antimicrobial resistance.
Week 15	Comprehensive Review
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	• Identification and classification of commonly used antibiotics.
Week 2	• Preparation of bacterial cultures for susceptibility testing.
Week 3	• Preparation of standardized bacterial inoculum.
Week 4	• Application of the Kirby–Bauer disk diffusion method .
Week 5	• Measurement of zones of inhibition.
Week 6	• Interpretation of antibiotic susceptibility results.
Week 7	• Determination of the Minimum Inhibitory Concentration (MIC) .
Week 8	• Determination of the Minimum Bactericidal Concentration (MBC) .
Week 9	Exam
Week 10	• Serial dilution techniques for antibiotic testing.
Week 11	• Evaluation of bacterial growth at different antibiotic concentrations.
Week 12	• Comparison of antibiotic susceptibility among different bacterial isolates.
Week 13	• Detection and interpretation of bacterial resistance patterns.
Week 14	• Investigation of multidrug-resistant bacterial isolates.
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Clinical and Laboratory Standards Institute (CLSI) – Performance Standards for Antimicrobial Susceptibility Testing.	NO
Recommended Texts	? Murray, P. R. et al. – Medical Microbiology. ? Murray, P. R. et al. – Manual of Clinical Microbiology. ? Jawetz, Melnick & Adelberg's Medical Microbiology. ? Bauman's Microbiology with Diseases by Taxonomy. ? ? World Health Organization (WHO) – Antimicrobial Resistance and Antimicrobial Stewardship Resources.	NO
Websites	www.google.com	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Biosafety		Module Delivery	
Module Type	suport		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MBO 48048			
ECTS Credits	2			
SWL (hr/sem)	60 hours/ 3 units			
Module Level	4	Semester of Delivery		2
Administering Department	MBO	College	SCI	
Module Leader	Dr. Sraa Nsayef Muslim		e-mail	Sraa.N.Muslim@kus.edu.iq
Module Leader's Acad. Title	Asst. Professor		Module Leader's Qualification	Ph.D
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Dr. Saad Hussein		e-mail	saad_2019@ku.edu.iq
Scientific Committee Approval Date	3/09/2026		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The overall goal of this study unit is to foster a robust culture of biosafety and biosecurity among students and to equip them with the knowledge and practical skills necessary to manage biological risks in accordance with international standards. 1- Developing analytical thinking for risk assessment 2- Instilling skills for containment and safe work practices 3- Ensuring compliance with laws and regulations 4- Building capacity for crisis and emergency management
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Knowledge & Understanding) 2- Intellectual & Analytical Skills 3- (Practical & Professional Skills
Indicative Contents المحتويات الإرشادية	1- Introduction to Biological Hazards and Conceptual Frameworks 2- Risk Assessment and Pathogen Classification 3- Biosafety Levels and Laboratory Design 4- Protection and control equipment 5- Disinfection, sterilization, and biological waste management 6- Emergency plans, biosecurity, and legislation

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Interactive Theoretical Foundation (Cognitive Learning) Because biosafety heavily relies on strict regulatory frameworks, passive lectures are replaced with active learning strategies: • Case-Based Learning (CBL): Students analyze real-world, historical Laboratory-Acquired Infections (LAIs) (e.g., the 2004 SARS lab leaks or historical anthrax exposures). This highlights the real-world consequences of protocol failure. • Flipped Classroom: Students review safety manuals, World Health Organization (WHO) biosafety guidelines, or regulatory videos at
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	home. Classroom time is entirely dedicated to risk assessment workshops and debating containment scenarios. • Gamified Quizzes: Weekly retrieval practice using interactive platforms (e.g., Kahoot! or Mentimeter) to reinforce critical knowledge like Risk Group classifications and chemical contact times. 2. Experiential & Immersive Learning (Psychomotor Skills) Biosafety cannot be mastered through textbooks alone; it requires muscle memory and behavioral compliance: • Simulation & Drill-Based Training: Students undergo timed, practical simulations for emergency responses, such as a mock biohazard spill drill involving fluorescent dyes to visually track "contamination." • Deliberate Practice (SOP Mastery): Repetitive, monitored practice of critical physical protocols: ○ Donning and Doffing: The exact sequence of putting on and removing Personal Protective Equipment (PPE) without self-contamination. ○ Aseptic Techniques: Operating inside a Biosafety Cabinet (BSC) to control airflow and prevent aerosol generation. • Peer-Led Safety Audits: Students take turns acting as "Biosafety Officers," using standardized checklists to inspect their peers' lab benches, waste segregation, and technique during experiments. •
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%(10)		
	Assignments	2	5%(5)		
	Projects / Lab.	1	20%(20)		
	Report	1	5%(5)		
Summative assessment	Midterm Exam	1hr	10%(10)		
	Final Exam	3hr	50% (50)		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Biosafety
Week 2	Defining the concepts of biosafety and biosecurity.
Week 3	Distinguishing between the four biosafety levels (BSL-1 to BSL-4).
Week 4	Identifying tools and practices for controlling biological hazards.
Week 5	Sterilization
Week 6	Mid Exam
Week 7	Laboratory Practices
Week 8	Safety Equipment / Primary Barriers
Week 9	Facility Design / Secondary Barriers
Week 10	Waste Management & Spills
Week 11	Decontamination
Week 12	Classification of hazards
Week 13	Biohazard Spills

Week 14	Chemical hazards and Id toxicity effects.
Week 15	Classification of microorganisms on the basis of hazard
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Biosafety and Biosecurity
Week 2	Biohazard
Week 3	Risk Groups
Week 4	Biosafety Levels - BSL
Week 5	Laboratory-Acquired Infections - LAIs
Week 6	Lab Equipment (Biosafety Cabinet – BSC, Centrifuge Safety Cups)
Week 7	Mid Exam
Week 8	Autoclave, Fume Hood, HEPA Filter
Week 9	Personal Protective Equipment – PPE
Week 10	Waste & Emergency
Week 11	Decontamination and Sterilization
Week 12	Biohazard Spill Kit
Week 13	Sharps Container
Week 14	Biohazard Bag
Week 15	Eye Wash Station

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	WHO Laboratory Biosafety Manual (4th Edition): The foundational global framework for risk-based biosafety management.	

Recommended Texts	• CDC/NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL): Comprehensive standards detailing specific containment criteria and agent-specific guidelines. •	
Websites	Wikipedia , YouTube , Google search , Researcher Gate	

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.				

نموذج وصف مادة دراسية

Module Information معلومات المادة الدراسية			
Module Title	Immune Chemistry		Module Delivery
Module Type	Core		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MBO 42044		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	2
Administering Department	MBIO	College	SC
Module Leader	Dr. Zainab Thamer.Showait	e-mail	ztsayye@kus.edu.iq
Module Leader's Acad. Title	professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Dr.Mustafa	e-mail	Mustafa.a@kus.edu.iq
Scientific Committee Approval Date	18/06/2023	Version Number	508 ق/أ.م

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims

أهداف المادة الدراسية

This course aims to study the molecular mechanisms underlying the function of the immune system while determining the nature of antibodies and antigens and their interactions. Immunohistochemistry also involves the use of antibodies as parameters of interest in the study of cells (immunocytochemistry) or tissues (immunohistochemistry).

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

- 1- Provide the student with a cognitive skill about the basic concepts of immunochemistry
- 2 - Provide the student with information about the chemical composition of antibodies and immune receptors
- 3 - Introducing the student to the most important principles of immunochemistry represented by the importance of immune interactions between molecules involved in the immune response
- 4- To understand the basic concepts of immunochemistry
- 5-- To describe the relationship between the basic concepts of immunology in a general way.
- 6- Cognitive analysis of the importance of diagnostic tests based on immunohistochemistry and its relationship to various diseases.

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Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A-Immune Chemistry :</u> Introduction in immune chemistry , Applications of immunochemistry , Immunomodulators (10 hrs) <u>Part B – Immunoglobulins(antibodies)</u> Structure of immunoglobulins, function of Immunoglobulins , types of immunoglobulins ,immunoglobulins class switching , phagocytosis (20 hrs) Revision problem classes. (3 hrs.) <u>Part C- immune cells activation</u> T cell activation , TNF-α , Mast cells activation (12 hrs)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Many strategies will be used in this module to encourage students to learn and develop their skills in serological tests such as participation in the exercises, seminars, lab experiments, and workshops related to the field of isolation, purification, and diagnosis of different diseases , as well as using educational videos and electronic to refine and expand their critical thinking skills. This will be achieved through classes, Interactive tutorials, and simple laboratory experiments that involve some activities of sampling, examining, and dealing with instruments and devices .

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4, 10	LO #1, 2,3,5,6,7,8,9 and 11
	Assignments	2	5% (5)	5, 11	LO # 3, 4, 6,7 and 8
	Projects / Lab.	1	20% (20)		
	Report	1	5% (5)	13	LO # 12
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – Definition of immune chemistry ,application of I.C.
Week 2	Immunomodulators, stimulants , suppressants .
Week 3	Immunoglobulins structure ,functions , types
Week 4	Immunoglobulins class switching , Antibodies Variants , MECHANISMS OF ISOTYPE OR CLASS SWITCHING .
Week 5	Phagocytosis , O ₂ independent killing mechanism
Week 6	Phagocytosis , O ₂ dependent killing mechanism ,detoxification ,free radical
Week 7	Mid-term Exam
Week 8	T cell activation , signals of T cell activation ,biochemical events of T cell activation
Week 9	TNF- α , TNF receptors and signaling pathways ,
Week 10	The Biological Activity of TNF- α ,paracrine action ,endocrine action, systematic effects of TNF- α .
Week 11	Hypothalamus-Pituitary-Adrenal axis , (HPA axis) and immune response .
Week 12	Mast cells activation ,function , mediators .
Week 13	Biochemical events of mast cell activation
Week 14	B-cell activation , BCR structure , T dependent Ag , T independent Ag
Week 15	Biochemical events of Bcell activation
Week 16	A preparatory week before the final exam .

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	-Top 7 Types of Immunochemical Techniques Used in Biochemistry

	-TYPES OF IHC
Week 2	Immunohistochemistry- Immuno-staining Protocol
Week 3	Immunohistochemistry -slides preparation
Week4	Frozen section(FR)
Week5	Immunocytochemistry (ICC)
Week 6	WESTERN BLOOTING (WB) IMMUNOBLOOTING
Week 7	MULTIPLEX IHC (mIHC)
Week	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	BASIC IMMUNOCHEMISTRY	no
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Microbial Toxins		Module Delivery
Module Type	C		☐ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☐ Seminar
Module Code	MBO 47041		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	4	Semester of Delivery	1
Administering Department	Microbiology	College	Science
Module Leader	Hanan Abdullah Ali	e-mail	Hanan1974@kus.edu.iq
Module Leader's Acad. Title	Doctorate lecture	Module Leader's Qualification	Ph.D.
Module Tutor	Saad_2019@kus.edu.iq	e-mail	Saad_2019@kus.edu.iq
Peer Reviewer Name	Dr. Saad Hussein	e-mail	Saad_2019@kus.edu.iq
Scientific Committee Approval Date	-----	Version Number	-----

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- to give the student a general Introducing to the most important principles of microbial toxicology. 2- Helping students to know the most important microbes and toxins that affect society, their causes and how to avoid . 3- Introduce to the types of bacteria that produce toxins (Bacterial and fungal). 4- Studying the therapeutic properties of microbial toxins .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing students to laboratory skills and their relationship to the applicable health system . 2. Students' knowledge of the most important types of toxins produced by pathogenic bacteria. 3. Emphasizing the preventive aspect of various diseases and increasing the skills of graduates in using the ways of prevention. 4. Introducing students to the most important pathogenic bacteria groups associated with the production of toxins. 5. Defining how to classify bacterial toxins based on several criteria. 6. Introducing the student to the most important diseases resulting from toxins, how to avoid their danger, and treatment in case of exposure 7. Introducing the most important immunological and non-immunological methods used in the diagnosis microbial toxins . 8. Introducing mycotoxins, their types and their impact on human health, besides the most important types of pathogenic fungi produced. 9. Interacting with scientific and technical experiences and expertise in a way that serves the community.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Introduction to microbial toxins : Definition of toxins, specifically bacterial toxins , Mycotoxins and some related terms represents in Viral toxins. [15 hrs] Types of toxins - endo and exotoxins , the features of each one , Nomenclature of toxins and Mechanism of action .[15 hrs] Bacteria producing toxins - Introducing the most important types of bacteria that produce endotoxins like <i>Salmonella sp.</i> , <i>Shigella sp.</i> , <i>Vibrio sp.</i> <i>E coli</i> besides the bacteria that produce exotoxins [10 hrs]

	<u>Part B – fundamentals</u> -Types of bacterial toxins: addressing some types of exotoxins such as Diphtheria toxin , <i>Pseudomonas aeruginosa</i> exotoxin A , Botulinum toxin, Tetanus toxin , Shiga toxin , Anthrax toxin , Staphylococcal enterotoxins . -Identification and determination of exotoxins: The most important methods used for the assessment of toxins such as Laboratory animals , Tissue cultures , Immunological assays as radioimmunoassay, reverse passive haemagglutination, reverse passive latex agglutination and ELISA , gel diffusion and Molecular biological techniques -Identification and determination of endotoxins.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main objective of this module is to train and encourage students to understand the contents of this module and intake the information provided through it to benefit from it in the future in the course of practical application of the academic specialization. This is done through classes and interactive training programs and the participation of students in this field.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.66
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10 % (10)	4, 8	LO #1, 2, 3,5,6 and 7
	Assignments	2	5 % (5)	5, 10	LO #2, 4, 6 ,8 and 9
	Projects / Lab.	1	20% (20)	Continuous	
	Report	1	5 % (5)	5	LO # 1-5
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-6
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2	Classification of bacterial toxins (exotoxins)
Week 3	Classification of bacterial toxins (Exotoxins)
Week 4	Classification of bacterial toxins (Mechanism of action)
Week 5	Classification of bacterial toxins (Activate immune response)
Week 6	Classification of bacterial toxins (structural model)
Week 7	Mid exam
Week 8	Tetanus toxin
Week 9	<i>Bacillus cereus</i> enterotoxins
Week 10	Therapeutic uses of bacterial toxins
Week 11	Mycotoxins
Week 12 & 13	Major groups of Mycotoxins
Week 14 & 15	Mycotoxins detection methods

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1 & 2 & 3 & 4	Production of bacterial toxin (endotoxins and exotoxins)
Week 5 & 6	Detection of bacterial exotoxins
Week 7	Mid Exam
Week 8 & 9	Detection of bacterial endotoxins
Week 10	Lethal dose 50% (LD 50)
Week 11 & 12	Mycotoxins preparation
Week 13 & 14	Mycotoxins detection techniques

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- P. Gopalakrishnakone , B. Stiles , A. Alape-Girón , J. D. Dubreuil & M. Mandal. Microbial Toxins.2018.springer.uk.	No

	-G. Pocsfalvi , G. Schlosser & O. Holst . Microbial Toxins: Methods and Protocols.2011.springer.	
Recommended Texts	-Pathogens and Toxins: Challenges and Interventions. V. K. Juneja & J. N. Sofos.2009.springer - Introduction to Food Toxicology, Second Edition -Microbial toxins and related contamination in the food industry. Laganà & Pasqualina. 2015.springer.	No
Websites	https://www.frontiersin.org/articles/10.3389/fmicb.2016.00042/full https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3564551/ https://www.jfda-online.com/cgi/viewcontent.cgi?article=3431&context=journal Microbial Toxins (BIOC 422) Bacterial Toxins (Introduction).	

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.				