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\\MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Biotechnology-1**	**Module Delivery**	
Module Type	**UoB12345**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-611**		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Huda Musleh Mahmood	**e-mail**	huda.mahmood@uoanbar.edu.iq
Module Leader's Acad. Title	Assist.Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**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 Objectives أهداف المادة الدراسية	1.Provide students the basic information about the principles of biotechnology. 2.This course aims to introduce students to some of the major process engineering techniques suitable for the biotechnology industry, to emphasize the role of microorganisms as a basis for classical and molecular biotechnology. 3.To inform students of the diverse applications of biotechnology in medical, agricultural, environmental and industrial sciences.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. A- Cognitive goals A1- Exploiting naturally produced biological products for research and commercial purposes. A2- Creating future studies based on identifying areas of biotechnology of special importance A3- Explain and model the problems associated with fermentation especially in batch formulation; Explain and define alternative methods for cell perturbation and recovery of biological extracts. A4- Identify the factors involved in the expression of proteins and other products by microorganisms. B - The soft skills objectives of the course. B1 - Learn modern techniques in the field of extracting various compounds from cells. B2 - personal interaction with the active researchers and the learning of deep discipline. B3 - Learn the techniques of genetic engineering, their cloning, and the detection of different products.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Principle of Biotechnology</u> The definition of biotechnology, classification of of biotechnology classes (red, white, blue,and green biotechnology). The role of microorganisms in this field , the species an different mms which used in this field. [15 hrs] How to use and introduce the mms in the biotechnology process. Different mms which use to adapt in biotechnology field [15 hrs]

	The knowledge about the genome, gene. Molecular genetic about the prokaryotes and eukaryotes [10 hrs] Definition about the mutation and mutagenesis at different levels and their classifications. [15 hrs] Practices and examples about different types of genomics, genetic codes and mutations [6 hrs] <u>Part B – Central Dogma</u> Fundamentals Replication, transcription, and translation. [15 hrs] Practices and examples about different mechanisms of gene regulation. [7 hrs] Gene therapy, stem cells, cloning. [15 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – principle of biotechnology
Week 2	Classes of biotechnology (red, white, blue and green biotechnology).
Week 3	Application of biotechnology
Week 4	Role of organisms in biotechnology fields.
Week 5	Gene, genome, and proteins
Week 6	DNA replication
Week 7	DNA transcription
Week 8	DNA translation
Week 9	Genetic codes examples and practices.
Week 10	Genetic engineering
Week 11	Gene therapy
Week 12	Stem cells
Week 13	Monoclonal antibody
Week 14	Uses of microbial toxins in biotechnology
Week 15	Practice and examples.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1Orientation about biotechnology lab
Week 2	Lab 2: Laboratory Apparatuses in biotechnology 1
Week 3	Lab 3: Microscope
Week 4	Lab 4: Sterilization
Week 5	Lab 5: culture media
Week 6	Lab 6: Pouring of solid media
Week 7	Lab 7: bacterial culture on solid and liquid media

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Applied molecular biotechnology, 2016 Molecular biology of the cell, Garland Science, 2008.	Yes
Recommended Texts	Biochemical Engineering Fundamentals" J. Bailey & D. Ollis, 2nd Edition, McGraw Hill, 2015	No
Websites	http://www.bio.com/resedu/educate2.html	

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	**Biology(plant)**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-612**		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Bihar Moqdad Abdulla	**e-mail**	bihar.alani1984@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**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 Objectives أهداف المادة الدراسية	1. To understand the basics of botany and its relationship to other biological sciences 2. To study the structure and function of the plant body and its classification 3. This course deals with the important species of plant especially those related to human. 4. To identify the effect of plant on food chain of other organisms and their spread in different environments 5. To learn about the role of plants in the fields of biotechnology
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1 - Recognize the basic concepts related to botany 2- Identify the living and non-living components of a plant cell 3- Distinguish the different types of tissues that make up the plant body 4-Understand the cell cycle 5- Distinguish the types of transport in vascular plants 5 - Understand the anatomical structure and the external shape of the various plant organs in a satisfactory manner and understand the basic information of the physiological processes that occur in the plant
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- The plant kingdom: an introduction 2- Plant anatomy and morphology 3-Plant physiology: understanding plant functions 4-Photosynthesis:the energy conversion process in plants 5-Plant ecology: interaction and adaptation 6-Plant systematics: classifying and naming plants

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered

Week 1	Lec.1: A tour of the cell part1
Week 2	Lec.2: A tour of the cell part2
Week 3	Lec.3: The plant body has a hierarchy of organs,tisues and cells
Week 4	Lec4: The cell cycle
Week 5	Lec.5: Meristematic generate cells for new organs
Week 6	First month Exam
Week 7	Lec. 6: Transport in vascular plants
Week 8	Lec.7: photosynthesis
Week 9	Lec.8: Cellular respiration
Week 10	Second month exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to botany
Week 2	Lab 2: Definition of optical microscope and how to use it
Week 3	Lab 3: Diagnosis of plant cells under a microscope
Week 4	Lab 4: The living and non-living components of a plant cell
Week 5	Lab 5: Types of crystals in plant cell
Week 6	Lab 6: Types of roots system
Week 7	Lab 7: Arrangement of veins in plant leaves
Week 8	Lab8: difference in leaf shape and Modified leaves
Week 9	Lab9: The stomatal system

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Campbell biology (Campbell biology series) 11th edition	No
Recommended Texts	James D. Mauseth .(1991).Botany : an introduction to plant biology 6th 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
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Module Information معلومات المادة الدراسية					
Module Title	**Biology(plant)**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-612**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	UGx11 1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Bihar Moqdad Abdulla		**e-mail**	bihar.alani1984@uoanbar.edu.iq	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Objectives أهداف المادة الدراسية	6. To understand the basics of botany and its relationship to other biological sciences 7. To study the structure and function of the plant body and its classification 8. This course deals with the important species of plant especially those related to human. 9. To identify the effect of plant on food chain of other organisms and their spread in different environments 10. To learn about the role of plants in the fields of biotechnology
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1 - Recognize the basic concepts related to botany 2- Identify the living and non-living components of a plant cell 3- Distinguish the different types of tissues that make up the plant body 4-Understand the cell cycle 5- Distinguish the types of transport in vascular plants 5 - Understand the anatomical structure and the external shape of the various plant organs in a satisfactory manner and understand the basic information of the physiological processes that occur in the plant
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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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation
تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Outcome	Learning
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11	
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7	
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Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Lec.1: A tour of the cell part1
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Week 8	Lec.7: photosynthesis
Week 9	Lec.8: Cellular respiration
Week 10	Second month exam

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Introduction to botany
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Week 5	Lab 5: Types of crystals in plant cell
Week 6	Lab 6: Types of roots system
Week 7	Lab 7: Arrangement of veins in plant leaves
Week 8	Lab8: difference in leaf shape and Modified leaves
Week 9	Lab9: The stomatal system

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Campbell biology (Campbell biology series) 11th edition	No
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Websites		

Grading Scheme مخطط الدرجات				
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biophysics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lab** ☒ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-613**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level			**Semester of Delivery**	1	
Administering Department			**College**	Type College Code	
Module Leader	Mazin A. Alalousi		**e-mail**	mazin_alalousi@uoanbar.edu.iq	

Module Leader's Acad. Title	Assistant. Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Mazin A. Alalousi	**e-mail**	mazin_alalousi@uoanbar.edu.iq
Peer Reviewer Name	Name	**e-mail**	E-mail
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 Objectives أهداف المادة الدراسية	المعرفة الأساسية بالفيزياء الحياتية: المفاهيم و التعريف و التطبيق المعرفة الأساسية ومدى استيعاب لتطبيقات الفيزياء في الانظمة الحياتية بصورة نظرية و التجارب العملية البسيطة. أن يفهم الطالب ما يطرأ على الحقل العلمي الذي يدرسه من تغيرات .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ- المعرفة والفهم: من خلال هذه الدراسة نتُوقع أن يكون الطالب قادرا على التعرف على أساسيات الفيزياء الحياتية ، ومُحاكاة الخواص المختلفة من خلال: - التعرف على الفيزياء و انواعها. - تعلم النظريات الحسابية المُختلفة المستخدمة في الفيزياء الحياتية. - التطبيق النظري الوصفي و بعض التطبيقات العملية في ما يخص الفيزياء الحياتية. ب- المهارات الخاصة بالموضوع: إشراك الطالب في تحضير محتوى المادة العلمية، وتدريبه على استخدام الإنترنت للدخول على المواقع العلمية لتجميع الموضوعات ذات الصلة بالمقرر وتنمية قدرته على الوصول إلى أحدث ما توصل اليه العلم كوسيلة للتحقق من: - القدرة على التعامل مع مصادر المعلومات. - القدرة على وضع استراتيجية بحثية ملائمة. - القدرة على تقييم مشاريع اقرانه من الطلبة. - القدرة على تحليل المعلومات البحثية المطلوبة . - القدرة على نقد الأبحاث المعروضة في الحلقات النقاشية.

	- القدرة على استخراج المعلومة الصحيحة بالطرق العلمية.
Indicative Contents المحتويات الإرشادية	يجب على الطالب تطوير مهارات التفكير من خلال الإلمام الجيد بالمُعادلاتالرياضية وتوظيفها في خدمة المُقرر كذلك يوفر المقرر للطالب الخلفية العلمية الجيدة كمدخل للفيزياء الحياتية. كذلك يوفر المقرر إشراك الطلبة بعد العرض بأسئلة تطبيقية وتدريبهم على بلورة المحاضرة بأسلوبهم لتنمية قدراتهم على البحث والالقاء، وعمل لقاءات علمية للطلبة لتعرض كل مجموعة العمل الذي قامت به وتم تنفيذه وتقييم هذه الاعمال ومقارنتها مع اعمال المجاميع الأخرى وذلك لتنمية الشخصية والقدرة على الإلقاء أمام الاخرين. أيضا تنمية روح التعاون عند الطلبة من خلال العمل الجماعي لترسيخ مبدأ احترام آراء الطلبة بعضهم لبعض و القدرة على المناقشة الجماعية لتقليل الفجوة بين الطلبة وأستاذ المادة. كذلك القدرة على تحمل المسؤولية لدى الطلبة مع بعضهم البعض من ناحية القيادة والانقياد خلق روح المنافسة لدى الطلبة عن طريق الأسئلة الذهنية المنبثقة عن فهم كاف للمادة العلمية

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	تشمل الإستراتيجيات الرئيسية ألقاء المحاضرات الأسبوعية للطلبة باستخدام وسائل التعلم الحديثة المعتمدة في التعليم و باسلوب تفاعلي (الالقاء النظري النمطي, الواجبات اللاصفية, التقارير , الوسائل البصرية الحركية من رسوم متحركة و فلام فديوية). اجراء التجارب العملية في المختبر لتطبيق بعض المفاهيم النظرية. .

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	5 and 10	
	Lab.		25% (25)		
	Report	2	5% (5)	13	
	First and Second-month Exams	1hr	15% (15)	5 & 10	
Summative assessment	Final Exam	3hr	50% (50)	16	All
	100% (100 Marks)				

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Biophysics
Week 2	Introduction to international system units *(SI Units)*
Week 3	Introduction to Mathematical Equations
Week 4	Some Physical Forces Exemplified in Man *(Newton's Three Laws of Motion, The Lever)*
Week 5	*Pressure, Blood Pressure: The Sphygmomanometer and Mercury Manometer*
Week 6	*Viscosity of Biological Fluids, Flow down a Pipe, Bernoulli's principle Bio-application*
Week 7	PROBLEMS
Week 8	1st Exam
Week 9	Fluid dynamics and Stokes' Law, Terminal Velocity
Week 10	Sedimentation under Gravity, A centrifuge
Week 11	A colloid, Classification of Colloids, **charge in colloidal particles,**
Week 12	Optical properties: Tyandall effect, **Electrical properties of colloids**
Week 13	The demonstration of electrophoresis
Week 14	2nd Exam
Week 15	Electrokineticphenomena, Zeta potential
Week 16	

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered	
Week 1	Simple pendulum	البندول البسيط
Week 2	Determining concentration using an absorption spectrophotometer	تحديد التركيز باستخدام مقياس الامتصاص الطيفي
Week 3	Hooke's law	قانون هوك
Week 4	Liquid viscosity measurement	قياس لزوجة السائل
Week 5	Blood pressure measurement	قياس ضغط الدم
Week 6	Venturi Meter	مقياس فنتوري
Week 7	Microscope	المجهر الضوئي

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Jearl walker, **Fundamentals of Physics,** 10th ed.	No
Recommended Texts	Raymond A. Serway and John W. Jewett, Jr. **Physics for Scientists and Engineers with Modern Physics, Ninth 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	Biostatistic	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BioT-614		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Name	**e-mail**	E-mail
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (MOHAMMED ABDULGAFOR MOHAMMED)	**e-mail**	E-mail: moh.abdulgafor@uoanbar.edu.iq
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	012/06/2023	**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 Objectives أهداف المادة الدراسية	Statistics is the science in which we make inferences about some specific random process based upon a sample of data which is sometimes quite limited. There are two major fields in statistics. The first deals with the theoretical underpinnings of the subject and focuses on developing new statistical methods and is called Mathematical Statistics. The second deals with the application of statistical methods to solve problems in a particular field of study and is termed Applied Statistics. Biostatistics is one area of Applied Statistics that concerns itself with the application of statistical methods to medical, biological and health related problems. This course is an introductory course in Biostatistics. This course is designed to teach public health students the basic principles of biostatistics. It can be a first course in biostatistics for those students who will use the knowledge they acquire to enable them to continue learning more advanced techniques in future statistical and biostatistical course work. It can also serve as the necessary base course in biostatistics for those who will go no further in acquiring advanced skills in biostatistics but who can use the knowledge they acquire to intelligently read journal articles that use biostatistical methods, interact effectively with professional biostatisticians in collaborative endeavors and understand the terminology of one of the core disciplines of public health. By the end of this course you should: • be able to discuss and explain what biostatistics is and how it is used in the field of public health • be able to participate in on line discussions about any topic or subject using skills developed in this course • be able to understand the common statistical techniques and terminology used in studies that are presented in the popular press and health related journals • be able to use and understand the principal numeric and graphical techniques to display and summarize medical and health related data • be able to understand the basic principles of probability and how they relate to biostatistics • be familiar with the common probability distributions that are used in statistical inference

	• be able to know what drawing a random sample from a population means and why it is important • be familiar with the most common sampling distributions used in biostatistics • be familiar with the concept of statistical inference • be able to estimate the value of various population parameters from a sample of data • be able to test the hypothesis that the value of a population parameter equals a certain value • be familiar with the sources of vital statistics data, how to interpret such data and how to perform basic tests to evaluate them • be familiar with what a life table is and what information it provides
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Learning outcomes-** 1. Student will able to learn about Plant tissue culture meaning, types, basic requirements and general procedure to culture a plant cell/ tissue/ organ. 2. Student will able to learn the basic technology to maintain a tissue culture lab and latest techniques of PTC. 3. Student will let to know about applications of PTC. 4. Student will learn about concept of edible vaccines, advantages, disadvantages, methods and applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. The module will cover the following topics: • **Section 1: An Introduction to Biostatistics**. This section includes sessions addressing the following topics: introduction to statistical methods for health, describing data, some tools for displaying and analysing quantitative data, regression and correlation analysis, sample size calculations, and statistical computing with STATA. • **Section 2: An Introduction to Epidemiology**. This section contains sessions covering the basic concepts of epidemiology, epidemiological measures of frequency of diseases, association of impacts, research design and interpretation, surveillance,outbreak investigation, validity and reliability of screening and

	diagnostic tests, ethics in epidemiology and the critical appraisal of research reports.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	363	**Structured SWL (h/w)**	64
Unstructured SWL (h/sem)	387	**Unstructured SWL (h/w)**	86
Total SWL (h/sem)	**150**		

Module Evaluation تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - ***Biostatistics***
Week 2	Terms in Biostatistics
Week 3	***Data in Biostatistics***
Week 4	***Data Presentation***
Week 5	***Measures of central tendency***
Week 6	**Measures of dispersion**
Week 7	***Normal probability distribution***
Week 8	***Estimation and Hypothesis Testing***
Week 9	T- test
Week 10	One Sample T-Test
Week 11	Two Sample T-Test

Week 12	Paired Sample T-Test
Week 13	**Elementary probability theory**
Week 14	**Binomial Distribution**
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to spss
Week 2	Lab 2: data
Week 3	Lab 3: inter data
Week 4	Lab 4: ***Data Presentation*** by spss
Week 5	Lab 5: data analysis
Week 6	Lab 6: View the results
Week 7	Lab 7: Interpretation of the results

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Introduction to ***Biostatistics***. Robert R. Sakal and F. James Rohlf *State University* (~f*New York at Stony Brook*	Yes
Recommended Texts	• R for Statistics Pierre-Andre Cornillon, Arnaud Guyader, Francois Husson, Nicolas Jegou, Julie Josse, Maela Kloareg, Eric Matzner-Lober, Laurent Rouvière. March 21, 2012 by Chapman	No

	and Hall/CRC. ISBN 9781439881453 (available at George Sand's library – exists also in French)	
Websites	https://www.uoanbar.edu.iq/staff-page.php?ID=479	

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	**(Arabic language) اللغة العربية**	**Module Delivery**	
Module Type	**Support**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UNI-122**		
ECTS Credits	**3**		
SWL (hr/sem)	**75**		

Module Level	UGx11 1	**Semester of Delivery**	2	
Administering Department	Bio	**College**	Sci	
Module Leader	Mohamed Noori Abbas	**e-mail**	moh.noori@uoanbar.edu.iq	
Module Leader's Acad. Title	Prof.	**Module Leader's Qualification**	Ph.D	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
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 Objectives أهداف المادة الدراسية	أ - تنمية معارف الطلبة للغة العربية، وأهميتها لهم. ب - أن يتعرف على شرح بعض سور القرآن الكريم، ويحفظها. ت- ان يتعرف الطالب على تاريخ الأدب، وأهم مراحل تطوره. ث- الاطلاع على شعراء لم يسبق للطالب التعرف عليهم ج- أن يضبط الطلبة كتابة الأملاء وعلامات الترقيم.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. القدرة على الحفظ والاستذكار 2. القدرة على الموازنة بين لغة ادب العصر المذكور والآداب الاخرى. 3. القدرة على المشاركة الجماعية للمحتويات الادبية للمادة 4. القدرة على تقديم المقترحات وحل المشكلات 5. القدرة على التفاعل مع المصادر والمراجع
Indicative Contents المحتويات الإرشادية	القران الكريم- سور ة الملك ، الآيات 1-10 ، القواعد، المبتدأ والخبر الأدب- مصطلح الأدب والعصور الأدبية الإملاء- كتاب الهمزة القران الكريم- سور ة الملك الآيات 11-20 القواعد- كان وأخواتها الأدب- قصيدة قم للمعلم لأحمد شوقي الإملاء- كتابة الضاد والظاء القران الكريم- سور ة الملك الآيات 21-30 القواعد- إن وأخواتها الأدب- قصيدة اللغة العربية لحافظ إبراهيم الإملاء- علامات الترقيم القواعد- التوابع الأدب- النثر العربي، المقامات الأدبية

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0 %		
	Essays	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (10)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	القران الكريم- سور ة الملك (الآيات 1-10)
Week 2	القواعد- المبتدأ والخبر
Week 3	الأدب- مصطلح الأدب والعصور الأدبية
Week 4	الإملاء- كتاب الهمزة
Week 5	القران الكريم- سور ة الملك (الآيات 11-20)
Week 6	القواعد- كان وأخواتها
Week 7	**first-term Exam**
Week 8	الأدب- قصيدة قم للمعلم لأحمد شوقي
Week 9	الإملاء- كتابة الضاد والظاء
Week 10	القران الكريم- سور ة الملك (الآيات 21-30)
Week 11	القواعد- إن وأخواتها

Week 12	الأدب- قصيدة اللغة العربية لحافظ إبراهيم
Week 13	الأدب- النثر العربي، المقامات الأدبية
Week 14	الإملاء- علامات الترقيم
Week 15	القواعد- التوابع
Week 16	**final-term Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر (**لا يوجد**)

	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	كتاب اللغة العربية للأقسام غير الاختصاص	Yes
Recommended Texts	كتب اخرى ضمن الاختصاص ذات اسلوب أكاديمي مفصل	yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Biotechnology-2**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-621**		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Huda Musleh Mahmood	**e-mail**	huda.mahmood@uoanbar.edu.iq
Module Leader's Acad. Title	Assist.Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail

Scientific Committee Approval Date	01/06/2023	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 Objectives أهداف المادة الدراسية	1.Provide students the basic information about the principles of biotechnology. 2.This course aims to introduce students to some of the major process engineering techniques suitable for the biotechnology industry, to emphasize the role of microorganisms as a basis for classical and molecular biotechnology. 3.To inform students of the diverse applications of biotechnology in medical, agricultural, environmental and industrial sciences.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. A- Cognitive goals A1- Exploiting naturally produced biological products for research and commercial purposes. A2- Creating future studies based on identifying areas of biotechnology of special importance A3- Explain and model the problems associated with fermentation especially in batch formulation; Explain and define alternative methods for cell perturbation and recovery of biological extracts. A4- Identify the factors involved in the expression of proteins and other products by microorganisms. B - The soft skills objectives of the course. B1 - Learn modern techniques in the field of extracting various compounds from cells. B2 - personal interaction with the active researchers and the learning of deep discipline.

	B3 - Learn the techniques of genetic engineering, their cloning, and the detection of different products.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Application of Biotechnology</u> Application in medicine Application in environment, agricultural application. [15 hrs] Aquatic application and industrial application [15 hrs] Mutatagenesis [10 hrs] cloning. [15 hrs] Practices and examples about different types of genomics, genetic codes and mutations [6 hrs] <u>Part B – Central Dogma</u> Restriction enzymes. [15 hrs] Molecular vectors [7 hrs] Protein engineering [15 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7

الحمل الدراسي المنتظم للطالب خلال الفصل			
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – mutagenesis , mutation and mutagen.
Week 2	Classes of mutations and practices
Week 3	Genetic cloning
Week 4	Genetic cloning techniques
Week 5	Restriction enzymes
Week 6	Vectors
Week 7	Hybrid vectors
Week 8	Vaccines
Week 9	Gene therapy
Week 10	Stem cells

Week 11	Monoclonal antibody
Week 12	Transgenic animals
Week 13	Transgenic plants
Week 14	Uses of microbial toxins in biotechnology
Week 15	Practice and examples.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1Orientation about biotechnology lab
Week 2	Lab 2: Laboratory Apparatuses in biotechnology-2
Week 3	Lab 3: Methods of cell disruptions
Week 4	Lab 4: application of physical, chemical, and biological methods of cell disruption.
Week 5	Lab 5: Estimation of proteins
Week 6	Lab 6: DNA extraction
Week 7	Lab 7:, DNA purification and estimation of concentration

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Applied molecular biotechnology, 2016 Molecular biology of the cell, Garland Science, 2008.	Yes
Recommended Texts	Biochemical Engineering Fundamentals" J. Bailey & D. Ollis, 2nd Edition, McGraw Hill, 2015	No
Websites	http://www.bio.com/resedu/educate2.html	

Grading Scheme
مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group	**A** - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	**B** - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	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	**animal**	**Module Delivery**	
Module Type	**B**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT622**		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		
Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept.	**College**	Type College Code
Module Leader	Name Rana Talib mohsen	**e-mail**	E-mail rana2011@uoanbar.edu.iq
Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail

Peer Reviewer Name	Name	**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023	**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 Objectives أهداف المادة الدراسية	Course objectives: Explain basic principles of zoology Clarify the interferences that may occur in the cells As well as clarifying the mechanics of tests and how to deal with models of all kinds As well as knowing the clinical importance and benefit of conducting laboratory tests As well as knowing the interpretation of results and how to write test results reports
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	a- Understanding ideas B- Raising the mental ability to think and reason C- Linking ideas with scientific reality and its applications D- Developing scientific logic and its tools h- Increasing the ability to recall G- Developing creativity and innovation individually and collectively
Indicative Contents المحتويات الإرشادية	Ability to perform scientific experiments b- The ability to write reports

	C- The ability to explore and innovate d- Literary boldness and expressing ideas

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

odule Evaluation تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covere
Week 1	Introduction
Week 2	Animal Cell
Week 3	Animal tissue
Week 4	Connective
Week 5	Epithelial
Week 6	Muscular
Week 7	Nervous
Week 8	Flat worms
Week 9	Filamentous Worms
Week 10	Arthropoda
Week 11	Evolution

Week 12	Endocrine system
Week 13	Respiratory system
Week 14	Endocrine system
Week 15	Animal Kingdom
Week 16	Animal Kingdom

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: **microscope**
Week 2	Lab 2: animal cell
Week 3	Lab 3: Animal tissue
Week 4	Lab 4: Connective
Week 5	Lab 5: Epithelial
Week 6	Lab 6: muscular
Week 7	Lab 7: Nervous
Week 8	Lab 8: **worms**
Week 9	Lab 9: The Blood
Week 10	Lab 10: Blood Clotting
Week 11	Lab11: Manual White Blood cell count
Week 12	Lab 12: Osmotic Relationships

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Recommended Texts	Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter (2010) Essential Cell Biology 3th ed, Garland Science, NY, USA.	
Websites	**WWW.Wikipedia.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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	organic Chemistry		**Module Delivery**		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	UoB12345				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**		1
Administering Department			**College**		
Module Leader	Assistant Prof. Dr. Mohammed abed kadhim		**e-mail**	Makm5772@uoanbar.edu.iq	
Module Leader's Acad. Title	Assistant Prof.		**Module Leader's Qualification**		Ph.D.
Module Tutor	---------		**e-mail**	--------	
Peer Reviewer Name	Teacher Dr. khdyer yaes khdyer		**e-mail**	khdyaralkubysy@uoanbar.edu.iq	
Scientific Committee Approval Date	14/06/2023		**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 Objectives أهداف المادة الدراسية	Study the basics of organic chemistry and what it contains of the physical and chemical properties of organic compounds, as well as general methods for the preparation of organic compounds. and analytics chemistry
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Quizzes = 40 ,Quizzes = 10 , Final exams = 50
Indicative Contents المحتويات الإرشادية	Make the student able to distinguish between organic compounds and name them as well as their properties and methods of preparation in order to be able to prepare derivatives of these materials and benefit from them

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**125**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**77**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**4**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Organic Chemistry
Week 2	Atomic structure and electronegativity
Week 3	Chemical bonds and resonance
Week 4	Solubility and hybridization
Week 5	Classification of organic carbon compounds
Week 6	Hydrocarbons
Week 7	Alkanes (paraffins
Week 8	1st Exam
Week 9	Introduction to Analytical Chemistry
Week 10	Some Basic Concepts
Week 11	Methods of Expressing Concentration of Solutions
Week 12	Introduction to Volumetric Methods of Analysis.
Week 13	Methods of Preparation Solutions and Chemical Calculations in Volumetric Titration Reactions
Week 14	Titration Curves for Complex Acid-Base Systems
Week 15	Precipitation Titration
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered

Week 1	Lab 1: Laboratory safety
Week 2	Lab 2: Glassware and chemicals
Week 3	Lab 3: distillation
Week 4	Lab 4: Preparation of alkanes
Week 5	Lab 5: Experiments in Preparation of Aqueous Solutions
Week 6	Lab 6: Equalizer Calibration
Week 7	Lab 7: Determination of Density of an liquid

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Essential Organic Chemistry . Paula Y. Bruice Second Edition	Yes
Recommended Texts		No
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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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	علم الحاسوب		**Module Delivery**		
Module Type	B		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	BioT-624				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Biotechnology		**College**	Sci	
Module Leader	Safwat abd alkadar hamad		**e-mail**	mcssafr@uoanbar.edu.iq	
Module Leader's Acad. Title	Asst. Lecturer		**Module Leader's Qualification**	Msc	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
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 Objectives أهداف المادة الدراسية	1. دراسة مبادئ علم الحاسوب وتقنية المعلومات 2. دراسة انواع مختلفة من اجهزة الحاسوب الحديثة 3. تعريف الطالب على اهم مكونات الحاسوب والانظمة الخاصة به 4. التعرف على انواع الحواسيب المستخدمة في مختلف المجالات العلمية 5. التعرف على انواع انظمة التشغيل المختلفة والمستخدمة في اجهزة الحاسوب
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. معرفة الطالب للمبادئ الرئيسية لعلم الحاسوب وتقنية المعلومات 2. فهم انواع مختلفة من اجهزة الحاسوب المستخدمة في مختلف المجالات 3. معرفة اهم مكونات الحاسوب وما هي اجزائه 4. معرفة كيف ادارة وتخزين البيانات داخل جهاز الحاسوب 5. معرفة اهم انظمة التشغيل المستخدمة في اجهزة الحواسيب 6. معرفة اهم التطبيقات الحاسوبية المستخدمة في مختلف المجلات
Indicative Contents المحتويات الإرشادية	يدرس الطالب اهم المواضيع التالية: 1. مراحل تطوير اجهزة الحاسوب بالإضافة الى نبذة تاريخه عن اهم اجهزة الحاسوب القديمة (6 ساعة) 2. مفاهيم عامة في علم الحاسوب من حيث انواع البيانات وطرق خزنها داخل الحاسوب (5 ساعة) 3. استخدامات الحاسوب بالإضافة الى انواعه المختلفة (5 ساعة) 4. دراسة المكونات المادية بصورة تفصيلية والتعرف على اهم مكوناتها (8 ساعة) 5. المكونات البرمجة والتطبيقات المستخدمة في اجهزة الحاسوب (8 ساعة) 6. دراسة انظمة الاعداد الخاصة بعلم الحاسوب والتعرف على اهمها (7 ساعة) 7. حساب مساحة التخزين بالنسبة للذاكرة الرئيسية والذواكر الثانوية (7 ساعة)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	تعزيز وصقل مهارات الطلبة باستخدام الحاسوب والتدريب على استخدام الانظمة الخاصة به وكيفية تطوير من قدرات الاستخدام الكفؤ لجهاز الحاسوب من خلال المحاضرات التفاعلية في المختبر اضافة الى المخطوطات الورقة والكتب المنهجية والمحاضرات وملفات PPT

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	مقدمة عن الحاسوب وتقنية المعلومات
Week 2	مراحل تطور الحاسوب
Week 3	البيانات المستخدمة في الحاسوب
Week 4	انواع الحواسيب واستخدامها
Week 5	المكونات المادية للحاسوب 1
Week 6	المكونات المادية للحاسوب 2
Week 7	المكونات البرمجية
Week 8	انظمة التشغيل
Week 9	البرامج التطبيقية
Week 10	لغات البرمجة
Week 11	مقايس اداء الحاسوب
Week 12	وحدات الخزن في الحاسوب
Week 13	انظمة الاعداد
Week 14	برامج الحماية للحاسوب

Week 15	الفايروسات والاختراق
Week 16	اسبوع تحضيري قبل الامتحان النهائي

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	مختبر 1: التعرف على طرق تركيب وتشغيل الحاسوب
Week 2	مختبر 2: التعرف على اهم المكونات المادية التي يتكون منها جهاز الحاسوب
Week 3	مختبر 3: تطبيقات على طرق خزن البيانات وكيفية حساباتها
Week 4	مختبر 4: تطبيق على احد انظمة التشغيل المهمة لجهاز الحاسوب
Week 5	مختبر 5: التجربة على بعض التطبيقات المكتبية في جهاز الحاسوب
Week 6	مختبر 6: تجربة وحل بعض انظمة العد المستخدمة في الحاسوب
Week 7	مختبر7: تطبيق بعض برامج الحماية من الفيروسات

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	كتاب (اساسيات الحاسوب وتطبيقاته المكتبية) الجزء الاول	Yes
Recommended Texts		
Websites	الاطلاع من خلال الانترنيت والتعرف اكثر عن هذا المجال	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**English language**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-625**		
ECTS Credits	**3**		
SWL (hr/sem)	**75**		

Module Level	B	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Mustafa Riyadh Muhammed	**e-mail**	ag.mustafa.riyadh@uoanbar.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

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

Module Objectives أهداف المادة الدراسية	The module objectives of studying Headway 1 are to help learners develop basic English language skills in the following areas: 1. Listening: Understand basic spoken English, including simple instructions, greetings, and everyday conversations. 2. Speaking: Use basic English words and phrases to introduce themselves, talk about their daily routine, interests, and ask and answer simple questions. 3. Reading: Read and understand simple texts, such as short articles, advertisements, and basic instructions. 4. Writing: Write simple sentences and short paragraphs about familiar topics, such as personal information, daily routine, and hobbies. 5. Vocabulary: Learn and use basic English vocabulary related to everyday life, such as food, transportation, weather, and common verbs. 6. Grammar: Understand and use basic English grammar structures, such as present simple, past simple, and basic sentence structures. By the end of Headway 1, learners should be able to communicate in basic English, understand simple spoken and written texts, and express themselves in simple writing. The course aims to build a solid foundation for further English language learning.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The module learning outcomes for Headway 1 are as follows: 2. Listening: By the end of the module, learners will be able to understand basic spoken English, including simple instructions, greetings, and everyday conversations. 3. Speaking: By the end of the module, learners will be able to introduce themselves, talk about their daily routine, interests, and ask and answer simple questions using basic English words and phrases. 4. Reading: By the end of the module, learners will be able to read and understand simple texts, such as short articles, advertisements, and basic instructions. 5. Writing: By the end of the module, learners will be able to write simple sentences and short paragraphs about familiar topics, such as personal information, daily routine, and hobbies. 6. Vocabulary: By the end of the module, learners will have learned and be able to use basic English vocabulary related to everyday life, such as food, transportation, weather, and common verbs.

	7. Grammar: By the end of the module, learners will understand and be able to use basic English grammar structures, such as present simple, past simple, and basic sentence structures. 8. Overall, the learning outcomes of Headway 1 are aimed at providing learners with a solid foundation in basic English language skills and preparing them for further English language learning.
Indicative Contents المحتويات الإرشادية	The vocabulary taught in Headway 1 includes basic words and expressions commonly used in everyday English conversations. Some of the vocabulary covered in Headway 1 are: Greetings and introductions: hello, hi, good morning, good afternoon, good evening, how are you?, I'm fine, thank you, etc. Personal information: name, age, nationality, occupation, family, etc. Numbers: one to one hundred, dates, time, etc. Daily routine: wake up, get up, have breakfast, go to work/school, come back home, have dinner, go to bed, etc. Colors: red, blue, green, yellow, etc. Food and drink: bread, milk, coffee, tea, water, etc. Weather: sunny, cloudy, rainy, hot, cold, etc. Places: home, school, office, supermarket, bank, post office, etc. Transportation: car, bus, train, taxi, bicycle, etc. Common verbs: be, have, go, come, do, like, want, need, etc. These are just some examples of the vocabulary covered in Headway 1. The course aims to build a strong foundation of essential English words and phrases to help learners communicate effectively in English.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Lecture 1: Introduction to English • Greetings and introductions • Personal information (name, age, nationality) • Basic verbs (be, have, do)
Week 2	Lecture 2: Daily Routine • Time and daily routine • Present simple tense • Common adverbs of frequency
Week 3	Lecture 3: Food and Drink • Vocabulary related to food and drink • Countable and uncountable nouns • Expressing likes and dislikes
Week 4	Lecture 4: Family and Friends • Family vocabulary • Possessive 's • Simple present tense for routines and habits
Week 5	Lecture 5: Leisure Time • Vocabulary related to leisure activities

	• Simple present tense for talking about habits and routines • Asking and answering questions about leisure activities
Week 6	Lecture 6: Weather and Seasons - Vocabulary related to weather and seasons - Present continuous tense for talking about current actions - Expressing preferences for seasons and weather
Week 7	Lecture 7: Transportation - Vocabulary related to transportation - Prepositions of place and direction - Asking for and giving directions
Week 8	Lecture 8: Shopping - Vocabulary related to shopping - Using 'there is' and 'there are' - Countable and uncountable nouns
Week 9	Lecture 9: Health and Fitness - Vocabulary related to health and fitness - Present continuous tense for talking about current actions - Expressing preferences for health and fitness activities
Week 10	Lecture 10: Review and Assessment - Review of all topics covered in the course - Assessment of students' progress and understanding of the material
Week 11	**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	
Week 8	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Headway 1 is a level of the New Headway coursebook series for English language learners.	Yes

Recommended Texts	British Council	No
Websites	https://learnenglish.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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**حقوق انسان وحرية وديمقراطية**	**Module Delivery**	
Module Type	**Support**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial**	
Module Code	**BioT-626**		
ECTS Credits	**3**		

SWL (hr/sem)	75			☐ **Practical** ☐ **Seminar**	
Module Level	1		**Semester of Delivery**	2	
Administering Department	Biotechnology		**College**	Sci	
Module Leader	عبد الجليل ابراهيم سويد بدر		**e-mail**	jl80jl80@uoanbar.edu.iq	
Module Leader's Acad. Title	مدرس مساعد		**Module Leader's Qualification**	Master	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
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 Objectives أهداف المادة الدراسية	أ - تنمية معارف الطلبة لحقوق الانسان والحرية والديمقراطية، وأهميتها لهم. ب - أن يتعرف على شرح بعض القوانين و ويحفظها. ت- ان يتعرف الطالب على تاريخ القوانين في حقوق الانسان والحريات العامة والخاصة، وأهم مراحل تطوره . ث- الاطلاع على بعض القوانين لم يسبق للطالب التعرف عليهم ج- أن يضبط الطلبة كتابة الأملاء وعلامات الترقيم.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	ا.تعريف الطالب بمبادئ حقوق الانسان واهميتها وخصائصها وانواعها في الدستور العراقي والدساتير العربية والمقارنة ب.اعداد باحثين جامعيين يمتلكون مهارات بحثية في مجال حقوق الانسان ج.تنمية الاتجاهات العلمية لدى الطلبة لتطوير قدراتهم الذاتية د.اعداد طلبة يمتلكون خبرة في مجال حقوق الانسان أ- الأهداف المعرفية أ1-اكساب الطالب المعرفة المتعلقة بمبادئ حقوق الانسان أ2- اكساب الطالب المعرفة بانواع حقوق الانسان

	أ3- اكساب الطالب المعرفة بحصائص حقوق الانسان أ4-اكساب الطالب المعرفة باهداف حقوق الانسان أ5-
Indicative Contents المحتويات الإرشادية	1- القانون الدستوري للعراق لسنة 2005 2- المواد الخاصة للحقوق والحريات العامة في المواثيق والمعاهدات الدولية 3- الاطلاع ع المواد الخاصة للحقوق والحريات في الدساتير المقارنة أهمها دساتير الولايات المتحدة الامريكية وبريطانيا وسويسرا 4- الاطلاع ع المواد الخاصة بالحقوق والحريات العامة في الدساتير العربية أهمها دستور الجزائر وتونس ومصر وغيرها من الدول العربية

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	6 - استراتيجية الحوار 7 - استراتيجية الملصقات التعريفية 8 - التدريس باستخدام التكنولوجيا 9 - استراتيجية إعداد المشاريع... 10 - استراتيجية تبادل الأدوار

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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
	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

Formative assessment	**Assignments**	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0 %		
	Essays	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (10)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	تعريف حقوق الانسان لغتا واصطلاحا
Week 2	معرفة خصائص حقوق الانسان
Week 3	التطور التاريخي لحقوق الانسان في الحضارات القديمة
Week 4	التطور التاريخي لحقوق الانسان في الحضارات الحديثة
Week 5	التطور التاريخي لحقوق الانسان في الاسلام
Week 6	تعريف الديمقراطية لغةً واصطلاحاً
Week 7	معرفة خصائص وانواع الديمقراطية والحريات العامة
Week 8	التطور التاريخي للديمقراطية والحريات العامة
Week 9	الحضارات التي تطرقت على الديمقراطية والحريات العامة
Week 10	الديمقراطية والحريات العامة في العصور القديمة
Week 11	الديمقراطية والحريات العامة في العصور الوسطى
Week 12	الديمقراطية والحريات العامة في العصور الحديثة
Week 13	الضمانات الاساسية في نجاح الديمقراطية
Week 14	الضمانات القانونية والسياسية والاجتماعية
Week 15	مبدأ استقلالية القضاء والحذف تجاوز السلطات على مبدأ الديمقراطية والحريات العامة
Week 16	**final-term Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر (**لا يوجد**)

	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	كتاب حقوق الانسان للمؤلف حميد حنون خالد	Yes
Recommended Texts	كتب اخرى ضمن الاختصاص ذات اسلوب أكاديمي مفصل	yes
Websites		

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Environmental biotechnology**			**Module Delivery**	
Module Type	**B**			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	BioT-632				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Biotechnology		**College**	Science	
Module Leader	Omar M. Hasan		**e-mail**	Sc.omerhasan@uoanbar.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Objectives أهداف المادة الدراسية	1. Introducing to the principles of environmental biotechnology as part of the biotechnology 2. Introducing students to the most important applications of biotechnology 3. Discussing the different mechanisms to address the problems of the environment and its pollution 4. Familiarity with the positive and negative aspects of different environmental technologies. 5. Studying means and techniques for maintaining a clean environment. 6. Understanding biosensing mechanisms for monitoring pollutants in the environment
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge and understanding: Familiarity with the scientific basics related to the physiology and metabolism of microorganisms and identification of the methods used to calculate microbial growth B. Subject-specific skills: 1. Understanding and getting used to the basic ideas contained within the various facts that the student is exposed to in practice and how these ideas are related. 2. Establishing a strong and solid foundation for microbial physiology. 3. The ability to read relevant research and scientific literature.
Indicative Contents المحتويات الإرشادية	lectures, tutorials, workshops, set readings. Two-hour lecture per week (total 28 hours). The tutorial will consist of a set questions put to the students to informally assess their understanding of the content of the lecture, to allow them to think about and solve example problems related to the lecture content, to express their understanding in English, and to correct any misunderstanding or gaps in their knowledge of the lecture's content.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises as well as a series of lectures and practical classes designed to introduce you to microbial physiology. At the same time, they are refining and expanding their critical thinking skills through topics covered in lectures, including what microorganisms are, their basic characteristics, structure, classification, nutrition, and metabolism. An interactive tutorial and by considering types of simple experiments (practical classes) offer training in basic microbiology techniques,

	including isolation, response toward different environmental conditions, death point measurement, and their sensitivity to antimicrobial agents. These activities are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Environmental Biotechnology
Week 2	Measurement of Environmental Pollution Types and Techniques

Week 3	Advanced Technologies for Wastewater Treatment
Week 4	Bioreactors for Wastewater Treatment
Week 5	Bioremediation Technologies for the Removal of Pollutants
Week 6	Bioremediation of Tannery Wastewater
Week 7	Sustainable Environmental Biotechnology
Week 8	Application of Nanotechnology in the Environment Biotechnology
Week 9	Bio-fertilizers and Biopesticides
Week 10	Approaches to Agro-industrial Solid Waste
Week 11	Genetically Modified Microorganisms
Week 12	Agriculture Biotechnology
Week 13	Recent Advances in Phytoremediation Technology
Week 14	Microbial Flora and Biodegradation of Pesticides
Week 15	Biosensors A Tool for Environmental Monitoring and Analysis
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: General instructions used in the laboratory and basic laboratory safety tools
Week 2	Lab 2: Signs and tools used in the laboratory
Week 3	Lab 3: Water quality analysis and Methods for measuring pH
Week 4	Lab 4: Methods for expressing concentration and preparing solutions
Week 5	Lab 5: Measurement of dissolved oxygen in water and Biological requirement of oxygen (BOD)
Week 6	Lab 6: Spectrophotometer , Atomic Absorption Spectrophotometer and Global Positioning System
Week 7	Lab 7: Measuring Salinity by Titration
Week 8	Lab 8: Measure CO2 in water
Week 9	Lab 9: Acidity and basicity measurement
Week 10	Lab 10: Instruments and equipment used to study soils
Week 11	Lab11: Determination of soil type, volume of interstitial voids, soil porosity, amount of organic matter, and measurement of pH
Week 12	Lab12: Salinity and electrical conductivity

Week 13	Lab 13: get your lab reports up to date, Revision for Module test

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Kumar R., Sharma A K., and Ahluwalia SS (2017) Advances in Environmental Biotechnology. Springer Nature Singapore	No
Recommended Texts	Kumar P. and Kumar V. (2018) Textbook of Environmental Biotechnology. Woodhead Publishing India Pvt. Ltd. New Delhi Evans GM, Furlong JC (2003) Environmental biotechnology. Theory and application. Wiley, Chichester.	No
Websites	https://www.uoanbar.edu.iq/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	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	Microbiology1			**Module Delivery**	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	BioT-633				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	B		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name ALI HAZEIM		**e-mail**	E-mail ali.hazim@uoanbar.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Objectives أهداف المادة الدراسية	- المعلومات الاساسية المتعلقة بالاحياء حقيقة النواة وبدائية نواة والفيروسا ت 2- نشوء وموقع واسس تصنيف الاحياء المجهرية 4- الخصائص المظهرية والتراكيب الدقيقة للبكتريا ومجاميع البكتريا3- الفطريات4- الطحالب 5– والابتدائيات 6-الفيروسات 7- مضادات الحيوية المؤثرة على نمو الكائنات المجهرية 8- وبائية الامراض والمقاومة والمناعة والامراض المتسببة عن الاحياء المجهرية
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ- الأهداف المعرفية أ- معرفة المبادئ الأساسية للاحياء المجهرية ب- أكتساب القدرة على معرفة الخصائص المظهرية والتراكيب الدقيقة للبكتريا ومجاميع البكتريا –الفطريات – الطحالب – الابتدائيات والفيروسات . ت- . دراسة تشخيص البكتريا
Indicative Contents المحتويات الإرشادية	**فهم الأحياء المجهرية: أن يكتسب الطالب مفهومًا أساسيًا للأحياء المجهرية وتصنيفاتها المختلفة، مثل البكتيريا والفيروسات والفطريات والبروتوزوا والطفيليات.** **فهم تركيب الأحياء المجهرية: أن يكتسب الطالب معرفة بتركيب الأحياء المجهرية، بما في ذلك بنية الخلايا المجهرية والأجزاء المكونة لها.** **فهم وظيفة الأحياء المجهرية: أن يكتسب الطالب فهمًا لوظائف الأحياء المجهرية وأهميتها في العديد من المجالات، مثل الصناعة والطب والبيئة.** **تكاثر الأحياء المجهرية: أن يكتسب الطالب معرفة بعمليات تكاثر الأحياء المجهرية ونموها، بما في ذلك التكاثر الجنسي والتكاثر اللاجنسي.** **التحليل والتشخيص: أن يكتسب الطالب مهارات في استخدام تقنيات المجهر والتحليل المختلفة للكشف عن الأحياء المجهرية وتشخيصها، مثل التلطيخ والتثبيت والتلوين المختلف.** **... الوعي بأمراض الأحياء المجهرية:**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**الاستراتيجية الرئيسية التي ستعتمد في تقديم هذه المادة هي تشجيع مشاركة الطلاب في التمارين، مع تنمية وتوسيع مهارات التفكير النقدي لديهم في نفس الوقت. سيتم تحقيق ذلك من خلال الحصص الدراسية والحصص التعليمية التفاعلية وعن طريق اعتماد أنواع من التجارب البسيطة التي تنطوي على بعض الأنشطة العينية التي تكون مثيرة للاهتمام للطلاب.**

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction to Microbiology**
Week 2	**Microbial Taxonomy**
Week 3	**Bacterial Cell Structure**
Week 4	**The growth**
Week 5	**Immunology**
Week 6	**Microbial genetics**
Week 7	**Pathogenic Microorganism**
Week 8	**Food microbiology**

Week 9	**Soil Microbiology**
Week 10	**Aquatic Microbiology**
Week 11	**AIR MICROBIOLOGY**
Week 12	**Algae**
Week 13	**Antibiotics**
Week 14	**Viruses**
Week 15	**Fungi**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

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

Websites	www.pearsonhighered.com

Grading Scheme
مخطط الدرجات

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Biosafety**	**Module Delivery**
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial**
Module Code	**BioT-635**	
ECTS Credits	**2**	

SWL (hr/sem)	**50**			☐ **Practical** ☐ **Seminar**	
Module Level	B		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Mustafa Riyadh Muhammed		**e-mail**	ag.mustafa.riyadh@uoanbar.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

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

Module Objectives أهداف المادة الدراسية	The course aims to introduce students to the first stage - biotechnology Introducing students to the importance of occupational safety and health, which is the science that is concerned with preserving human safety and health, by providing safe work environments free from the causes of accidents, injuries or occupational diseases, or in other words it is a set of procedures, rules and systems within a legislative framework aimed at preserving people from danger Injury and the preservation of property from the risk of damage and loss.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module learning outcomes for Biosafety and Security can vary depending on the specific course or program, but here are some general learning outcomes that may be covered: 1. Understanding the concepts and principles of biosafety and biosecurity, including risk assessment, mitigation, and management. 2. Knowledge of the different types of biological agents and their potential impact on human health, animal health, and the environment.

	3. Understanding the different types of biosafety and biosecurity facilities, including laboratory design and engineering controls, as well as the personal protective equipment and safety procedures required for working with biological agents. 4. Knowledge of the regulations, guidelines, and ethical considerations related to biosafety and biosecurity, including national and international regulations such as the Biological Weapons Convention and the International Health Regulations. 5. Understanding the importance of communication and collaboration between different stakeholders in the field of biosafety and biosecurity, including researchers, laboratory staff, public health officials, and regulatory agencies. 6. The ability to conduct risk assessments and implement appropriate mitigation strategies for different types of biological agents and laboratory settings. 7. Knowledge of emergency response procedures and protocols for different types of biological incidents, including outbreak investigations and bioterrorism events. 8. Understanding the key principles of biosafety and biosecurity management, including training and education, quality assurance, and continuous improvement. Overall, the module learning outcomes for Biosafety and Security aim to provide students with an in-depth understanding of the principles, practices, and regulations related to working with biological agents in a safe and secure manner, as well as the skills and knowledge needed to effectively manage and respond to biosafety and biosecurity incidents.
Indicative Contents المحتويات الإرشادية	The indicative contents for a Biosafety and Security course can vary depending on the specific program or course, but here are some general topics that may be covered: 1. Introduction to Biosafety and Biosecurity: Definitions, principles, and regulations related to biosafety and biosecurity. 2. Risk Assessment and Management: Methods for conducting risk assessments and developing appropriate mitigation strategies, including engineering controls, administrative controls, and personal protective equipment. 3. Biological Agents: Characteristics of different types of biological agents, including bacteria, viruses, fungi, and toxins, and their potential impact on human health, animal health, and the environment. 4. Laboratory Design and Engineering Controls: Design and construction of biosafety level (BSL) facilities, including engineering controls such as air handling systems, safety cabinets, and decontamination systems. 5. Personal Protective Equipment (PPE) and Laboratory Practices: Types of PPE, including gloves, gowns, respirators, and safety glasses, and laboratory practices such as aseptic techniques and decontamination procedures.

	6. Regulatory Compliance: Regulations and guidelines related to biosafety and biosecurity, including national and international regulations such as the Biological Weapons Convention, the International Health Regulations, and the Select Agent Program. 7. Emergency Preparedness and Response: Planning and response procedures for different types of biological incidents, including outbreak investigations and bioterrorism events. 8. Quality Assurance and Continuous Improvement: Management systems and quality assurance programs for biosafety and biosecurity, including training and education, internal audits, and continuous improvement. 9. Communication and Collaboration: Importance of communication and collaboration between different stakeholders in the field of biosafety and biosecurity, including researchers, laboratory staff, public health officials, and regulatory agencies. Overall, this course aims to provide students with a comprehensive understanding of the principles, practices, and regulations related to working with biological agents in a safe and secure manner, as well as the skills and knowledge needed to effectively manage and respond to biosafety and biosecurity incidents.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	مقدمة في السلامة الحيوية
Week 2	السلامة الأحيائية
Week 3	الاخطار البايولوجية
Week 4	طرق السيطرة على المخاطر البايولوجية
Week 5	الاختيار المناسب للعاملين في المختبرات
Week 6	أهداف العلاقات الإنسانية
Week 7	النفايات الخطرة
Week 8	إجراءات وطرق التداول والتعامل مع المخلفات المختبرية
Week 9	الأمن البيولوجي
Week 10	المعنيون بالأمن البيولوجي
Week 11	مبادئ مختبر السلامة البيولوجية
Week 12	منهجية ادارة المخاطر
Week 13	عناصر برامج السلامة البايولوجية
Week 14	الامن المعلوماتي
Week 15	**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	
Week 8	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- Biosafety in Microbiological and Biomedical Laboratories (BMBL) - Centers for Disease Control and Prevention (CDC).	Yes
Recommended Texts		No
Websites	: https://www.cdc.gov/labs/pdf/CDC-BiosafetyMicrobiologicalBiomedicalLaboratories-2009-P.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	**General Genetics**	**Module Delivery**	
Module Type	**Basic learning activities**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-644**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		

Module Level	UGII	**Semester of Delivery**	4
Administering Department	BioT	**College**	Type College Code
Module Leader	Dr. Rafat H. Abduljaleel Alhadithi	**e-mail**	sc.r_alhadithi@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**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 Objectives أهداف المادة الدراسية	1. Understanding the concept of genetics in general. 2. The student would be able to know the method of transmission of genetic information through generations. 3. This course deals with the basic concept of genetics and inheritance. 4. The student would be able to know the factors affecting the inheritance of genes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing the terms used in general. 2. Explaining the nature, structure and function of chromosomes. 3. Explaining the role of chromosomes and genes in the emergence of genetic diseases and congenital anomalies. 4. Knowing how to determine sex in various living organisms. 5. Compare the theories of genetics, Mendelian laws, and types of dominance and divergence from Mendelian laws. 6. Solve genetic problems based on Mendelian laws and their modifications, and on sex-linked problems. 7. Designing genetic experiments and analyzing their results. 8. Breeding methods for some model organisms. 9. Conducting experiments and learning Mendelian laws of inheritance. 10. Analysis of non-Mendelian genetic experiments.
Indicative Contents المحتويات الإرشادية	Mendelian and complex genetic inheritance patterns, gene mutation, Alleles, sex-chromosomes and sex determination, genetic-linkage and genetic maps.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Provide the basic information to understand the principles and concepts of gene and genome organization, control of gene expression, effect of mutations on the organism and methods and approaches employed in studying their structure, organization and expression and their regulation. Methods and approaches will be taught specifically in the context of the theory

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**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	4% (4)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	3% (3)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	25% (25)	Continuous	All
	Report	1	3% (3)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Genetics
Week 2	Mendel's First Law: Segregation of Alleles
Week 3	MENDEL'S SECOND LAW: INDEPENDENT ASSORTMENT
Week 4	ALLELES AT A SINGLE LOCUS
Week 5	Part 2ALLELES AT A SINGLE LOCUS
Week 6	SEX CHROMOSOMES: SEX DETERMINATION
Week 7	Mid-term Exam
Week 8	SEX CHROMOSOMES: DOSAGE COMPENSATION
Week 9	Part 2 SEX CHROMOSOMES: DOSAGE COMPENSATION
Week 10	GENES ON THE SAME CHROMOSOME: LINKAGE

Week 11	Part 2 GENES ON THE SAME CHROMOSOME: LINKAGE
Week 12	RECOMBINATION MAPPING OF GENE LOCI
Week 13	Part 2 RECOMBINATION MAPPING OF GENE LOCI
Week 14	POPULATION GENETICS
Week 15	GENETIC DISEASES
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	حشرة الدروسوفيلا
Week 2	لتمييز بين الذكور و الإناث
Week 3	لطفرات - الرموز - النسخ المظهرية
Week 4	قانون مندل الأول
Week 5	قانون مندل الثاني
Week 6	لارتباط و العبور و الخرائط الوراثية Linkage , Crossing over and Genetic maps
Week 7	لوراثة المرتبطة بالجنس

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Open Genetics Lectures. Department of Biological Sciences – University of Alberta, Canada	Yes
Recommended Texts	Concepts of Genetics (12th Edition), 2019, William S. Klug, Michael R. Cummings	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
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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	**Animal physiology**	**Module Delivery**	
Module Type	**B**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BIOT-653**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		

Module Level	5	**Semester of Delivery**	1
Administering Department	Type Dept.BIOTECHNOLOGY	**College**	Type College Code
Module Leader	Name Rana Talib Mohsen	**e-mail**	E-mail rana2011@uoanbar.edu.iq
Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**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 Objectives أهداف المادة الدراسية	Course objectives: Teach students the basics of immunology and serology in all its subjects, with examples and everything Related to this science of applications, especially with regard to the diagnosis of diseases that affect The human being (the health aspect) in a way that achieves a solid scientific background among students in the field of immunology to take their active role in serving individuals and society.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	a- Understanding ideas B- Raising the mental ability to think and reason C- Linking ideas with scientific reality and its applications D- Developing scientific logic and its tools h- Increasing the ability to recall G- Developing creativity and innovation individually and collectively
Indicative Contents المحتويات الإرشادية	Ability to perform scientific experiments b- The ability to write reports C- The ability to explore and innovate d- Literary boldness and expressing ideas

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes,

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Cell physiology , cell structure , cell organeals , cell membrane , endomembrane system and mitochondria
Week 2	Plasma membrane structure and function method of transport across the plasma membrane. Simple diffusion ,active transport facilitated diffusion and osmosis.

Week 3	Nervous system physiology , types of nervous , types of supporting cell electrical activity of nervous , action potential, types of synapse electrical synapse chemical synapse
Week 4	Neural transmitters , acetylcholine in C.N.S. , acetylcholine in P.N.S. of acetylcholine , mechanism of action of acetylcholine , mono amines as a neuro transmitter , mechanism of action of monoamine as aneuro transmitter .
Week 5	Endocrine glands secretion and action of hormones . endocrine glands and hormones , neuro , hormones . chemical hormone classification of hormones. Amines , polypeptides and protein . lipid derived hormones , estrogen ,progesterone , testosterone , pancreatic islets
Week 6	Common aspects of renal and endocrine regulation hormonal inter action , synergistic
Week 7	Kidney anatomy and physiology . function of kidney , The kidney and nephron glomerular filtration rate . filtration in Kidney , reabsorption and factors effect reabsorption secretion . counter current exchange . hormones produced by the kidney renin angrotention aldosterone antidiuretic hormone .
Week 8	Reproductive system female
Week 9	Reproductive system male
Week 10	Emberiogenesis
Week 11	Physiology Of Central Nervous System)
Week 12	Blood
Week 13	hormone action
Week 14	Mechanism of thyroid hormone action .hormone that use 2nd messengers . pituitary gland Centerior and posterior pituitary Hypothalamic control of anterior pituitary
Week 15	Hypothalamic control of posterior pituitary .feedback control of anterior pituitary
Week 16	adrenal gland hormones adrenal cortex and adrenal medulla production of thyroid hormones and diseased of thyroid parathyroid gland . pineal gland

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab 1: The Blood**
Week 2	**Lab 2: Complete Blood Count (CBC)**
Week 3	**Lab 3: Differential White blood cells count (Differential leukocytes count)**
Week 4	**Lab 4: Manual Red Blood Cell Count**
Week 5	**Lab 5: Blood Coagulation (Hemostasis)**

Week 6	**Lab 6: Determination of blood groups and measurement of blood pressure**
Week 7	**Lab 7: Osmotic Relationships**
Week 8	**Lab 8: Frogs experiments: Capillary circulation**
Week 9	**Lab 9: Frog's Experiment**
Week 10	**Lab 10: Widal test**
Week 11	**Lab11: Rose Bengal**
Week 12	**Lab 12: CRP**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Recommended Texts	Human anatomy and physiology - Human physiology Ganong -	
Websites	**WWW.Wikipedia.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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biochemical techniques**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT 655**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Safaa Abed Lateef		**e-mail**	Sc.safaa-meani@uoanbar.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Objectives أهداف المادة الدراسية	يهدف المقرر الى تعريف طلبة المرحلة الثالثة – قسم التقنيات الاحيائية باهم التقنيات التي من خلالها يستطيع الطالب من استخلاص و تنقية و تشخيص المركبات البايولوجية مثل تقنيات تكسير الخلايا الحية بكافة انواعها و عمليات الترسيب و التنقية مثل تقنية التبادل الايوني و الترشيح الهلامي و غيرها و من ثم تعريف الطلبة كيفية تشخيص و كذلك تقنيات TLC, GC , HPLCالمركبات المستهدفة مثل الترحيل الكهربائي و PCRالتشخيص الجزيئي مثل
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	ث- المعرفة والفهم: ج- اكتساب الخبرة في تنمية الخلايا المايكروبية ح- ايجاد البيئات الملائمة في انتاج النباتات باستخدام الزرع النسيجي خ- اكتساب الخبرة في التعامل مع الملوثات البيئية و كيفية معالجتها د- تحديد انواع المجسات المايكروبية و المقارنة مع انواع المجسات الاخرى ذ- اكتساب المهارة في كلونة الجينات و نقلها بين انواع الخلايا المختلفة
Indicative Contents المحتويات الإرشادية	1- تقارير علمية 2- انشطة عملية اثناء المحاضرة مناقشة مسالة معينة وايجاد الحلول بمشاركة الطلبة كل مجموعة على حده

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	▪ الاختبارات اليومية المفاجئة والاسبوعية المستمرة ▪ التدريبات والانشطة في قاعة الدرس ▪ ارشاد الطلبة الى بعض المصادر التي تحتوي على التقنيات الاحيائية

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

الحمل الدراسي غير المنتظم للطالب خلال الفصل			
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Biotechnology Concept and its History
Week 2	Destruption of cells
Week 3	Proteins precipitation
Week 4	Ion exchange chromatography
Week 5	Gel chromatography
Week 6	Affinity chromatography
Week 7	Hydrophobic chromatography
Week 8	Mid-term Exam
Week 9	HPLC
Week 10	GC and TLC
Week 11	Electrophoresis

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: **Laboratory Apparatuses in biotechnology 1**
Week 2	Lab 2: Cell disruption
Week 3	Lab 3: **Protien precipitation**
Week 4	Lab 4: **Quantitation of protein**
Week 5	Lab 5: Dialysis
Week 6	Lab 6 **: Ion exchange chromotography (IEC)**
Week 7	Lab 7: **Gel filtration chromatography**
Week 8	Lab8 : **Thin Layer Chromatography**
Week9	Lab9 : Gas Chromatography–Mass Spectrometry (GC-MS) and HPLC
Week10	Lab10 : Extraction of bacterial DNA
Week11	Lab11 : Quantification of DNA
Week12	Lab12 : PCR
Week13	Lab13 : **Determination of Fat in potato chips , Extraction of β-carotene from carrot , Extraction of starch from**
Week 12	Polymerase chain reaction
Week 13	PCR troubleshooting
Week 14	Real time –PCR
Week 15	**Preparatory week before the final Exam**
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- John E. Smith(2010). Biotechnology, fifth edition. – CAMBRIDGE UNIVERSITY PRESS. 2- Desmond	Yes

	S.T.Nicholl(2010). An introduction to genetic engineering . CAMBRIDGE UNIVERSITY PRESS.	
Recommended Texts	A Textbook of Biotechnology	No
Websites	file:///C:/Users/Safaa/Downloads/AnIntroductiontoGeneticEngineering.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	**Microbial Genetics**	**Module Delivery**
Module Type	**Basic learning activities**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial**
Module Code	**BioT-661**	
ECTS Credits	**5**	

SWL (hr/sem)	**125**			☐ **Practical** ☐ **Seminar**	
Module Level		UGIII	**Semester of Delivery**		6
Administering Department		BioT	**College**	Type College Code	
Module Leader	Dr. Rafat H. Abduljaleel Alhadithi		**e-mail**	sc.r_alhadithi@uoanbar.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**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 Objectives أهداف المادة الدراسية	5. Understanding of fundamental concepts in microbial genetics. 6. Insight into genetic methods used to investigate interesting biological problems. 7. Insight into current, exciting topics in microbial genetics and related fields. 8. Experience in reading and evaluating scientific articles. 9. Understanding of how microbial genetics has advanced science and society.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student should be able to: 11. explain the processes behind mutations and other genetic changes 12. identify and distinguish genetic regulatory mechanisms at different levels 13. solve theoretical and practical problems in genetic analysis particularly concerning genetic mapping and strain construction 14. identify genes and mutations in non-annotated sequence data from databases by means of relevant bioinformatics programs 15. plan basic experiments in microbial genetics concerned with clarifying phenotypes and their relationship with the genotype 16. use common methods in microbial genetics 17. describe and summaries experimental work in a correct way in a laboratory notebook.

Indicative Contents المحتويات الإرشادية	Mechanisms behind stability and change in microbial genomes. Mechanisms behind the information flow from DNA to proteins and the multiple levels at which gene expression can be regulated. Genetic aspects of extrachromosomal elements such as bacteriophages and plasmids. Genetic methods to construct, map and move mutations, and to measure gene expression, and through exercises in problem-solving at seminars where scientific data are analyzed. Laboratory sessions where the students through strain construction, genetic selection and screening familiarize themselves with important and common methods in microbial genetics. Careful and proper use of a laboratory notebook to record laboratory work.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The course is intended to provide students with a broad exposure to several fundamental aspects of genetics through lectures, in-class discussion, assigned textbook readings, and study groups.

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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	4% (4)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	3% (3)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	25% (25)	Continuous	All
	Report	1	3% (3)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	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	مقدمة الى وراثة الاحياء المجهرية
Week 2	جينوم البكتيريا
Week 3	العوامل الوراثية خارج الكروموسوم البلازميدات
Week 4	العوامل الوراثية خارج الكروموسوم البلازميدات
Week 5	العوامل الوراثية خارج الكروموسوم القفازات
Week 6	التحول البكتيري Transformation
Week 7	الاقتران البكتيري Conjugation
Week 8	التحول بالعاثي Transduction
Week 9	Mid-term Exam
Week 10	تضاعف الدنا في بدائية النواة DNA Replication in Prokaryotes
Week 11	التعبير الجيني Gene Expression
Week 12	عملية الترجمة وصناعة البروتين Translation and Protein Synthesis
Week 13	شفرة البدايةStart codon
Week 14	تنظيم التعبير الجيني Regulation of gene expression
Week 15	Gene Cloning
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Isolation of DNA from *E. coli*
Week 2	ستخلاص الـ RNA من بكتيريا الـ *E. coli*
Week 3	لطفرات التلقائية ستريبتومايسين
Week 4	لطفرات التلقائية replica plating
Week 5	لطفرات المستحثة induced mutations
Week 6	Cloning 1
Week 7	Cloning 2

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Molecular Genetics of Bacteria, Fifth Edition. By Jeremy W. Dale and Simon F. Park. (2010)	Yes
Recommended Texts	iGenetics: A Molecular Approach. 3rd Edition. by Peter Russell. (2009) Molecular Genetics of Bacteria. Fourth Edition. By Larry Snyder *et al*. (2013)	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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Plant physiology	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BioT-664		
ECTS Credits	**6**		
SWL (hr/sem)	**125**		

Module Level	6	**Semester of Delivery**	6
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Name:	**e-mail**	E-mail
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (MOHAMMED ABDULGAFOR MOHAMMED)	**e-mail**	E-mail: moh.abdulgafor@uoanbar.edu.iq
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	13/06/2023	**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 Objectives أهداف المادة الدراسية	Plant physiology is the study of how plants function. In this course we will explore the link between form and function in plants. This course is designed to survey contemporary aspects of plant physiology with emphasis on recent research progress in related fields. 1. Topics covered plant water relations water transport, 2. mineral nutrition, carbon and nitrogen metabolism (photosynthesis, respiration, and N assimilation), 3. plant growth and development. An understanding of the biology of plants has implications for our ability to address applied questions and issues facing our world today such as agricultural concerns, handling threatened species and habitats, and global changes and increased appreciation for plants as fascinating and important components of our living world
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Demonstrate detailed knowledge of plant specific features of cellular organisation and processes. 2. Demonstrate a cogent understanding of the process and regulation of photosynthesis. 3. Demonstrate a critical understanding of plant hormones and their role in the life cycle and responses to the environment. 4. Demonstrate a detailed understanding of how plants respond and adapt to environmental conditions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Learning Outcomesexplain the water, solute and sugar transport processes in plants. 2. They explain the different mechanisms in plants used for water transport. 3. They explain how plants achieve water balance. 4. They explain plant disorders occured in mineral deficiency. 5. They explain the forms of nitrogen in biogeochemical cycle. 6. They explain the nitrate assimilation.They explain the ammonium assimilation. 7. They explain the biological nitrogen fixation. 8. They explain phosphate, cation and oxygen assimilation.will be explain the relations between secondary metabolites and plant defense.

	9. They explain the structures of the cutin, suberin and waxes and their roles in plant defense. 10. They explain the roles of terpenes, phenolic compounds and nitrogen containing compounds in plant defense. 11. They explain the plant pathogen interactions and plant defense mechanism against pathogens.explain the roles of light in plant development.They explain the photochemical and biochemical characteristics of phytochrome. 12. They explain the light control of circadian rhythms. 13. explain the plant hormones and their roles in plant development.They explain the structure and properties of each plant hormone. explain the physiological changes occured during different stress conditions such as water deficit, salinity, heat and chilling stresses..

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	444	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	46
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	276	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	79
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
	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – plant cell
Week 2	Plant Water Relations
Week 3	Plant-water Relations: Uptake and transport.
Week 4	Plant water Relations: Water deficit
Week 5	Plant Nutrition
Week 6	Introduction to Plant Nutrition.
Week 7	Macro and micronutrients. Exam I
Week 8	Photosynthesis
Week 9	Photosynthesis overview. Light, pigments, and plastids
Week 10	Photosynthetic light-dependant reactions
Week 11	Photosynthesis: Carbon Fixing reactions. C3, C4, and CAM Plants
Week 12	Introduction to Plant Hormones. Exam II.
Week 13	Auxins and cytokinins
Week 14	Giberellins and Absicic acid

Week 15	Ethylene and others
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: **principles of work in the laboratory**
Week 2	Lab 2: **Colloids**
Week 3	Lab 3: **Types of solution**
Week 4	Lab 4**: Spread**
Week 5	Lab **5 Permeability**
Week 6	Lab 6: **Water absorption**
Week 7	Lab 7**: Plant Nutrition**
	Lab8: **: Photosynthesis in plants**
	Lab9 : Plant Hormones

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	* Hopkins, W.G. and Hunter, N.P.A. (2008). Introduction to Plant Physiology (Fourth Edition). Hoboken, NJ: Wiley Publishing.	Yes
Recommended Texts	Taiz, L., Zeiger, E., Møller, I.M., and Murphy, A. (2018). Plant Physiology and Development (Sixth Edition). Sunderland, MA: Sinauer Associates.	No
Websites	https://www.uoanbar.edu.iq/staff-page.php?ID=479	

Grading Scheme
مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group	**A** - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	**B** - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	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 and Application**	**Module Delivery**	
Module Type	**Basic learning activities**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BioT-672**		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		
Module Level	UGIV	**Semester of Delivery**	7
Administering Department	BioT	**College**	Type College Code
Module Leader	Dr. Rafat H. Abduljaleel Alhadithi	**e-mail**	sc.r_alhadithi@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**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 Objectives أهداف المادة الدراسية	This course will provide students with the recent knowledge of genetic engineering. At the end of the course, a successful student will be able to 1. understand and explain the concept of genetic engineering including the techniques, applications and limitations. 2. demonstrate the ability to design recombinant molecules and apply information extracted from a variety of sources including journal articles, technical bulletins, product manuals, and drug information sheet to solve problems. 3. apply learned knowledge to their future research.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	18. Understanding the definition and history of genetic engineering 19. Knowledge of basic molecular biology techniques used for handling of living and clone cells 20. Knowledge of different enzymes and vectors used in the genetic engineering field. 21. Understanding the use of the genetically modified organisms in medicine, industrial and agricultural field. 22. Practical knowledge of the operation of certain equipment (Thermal cycler, Gel documentation system) and instruments to amplify the DNA templates, and examine PCR products. 23. Practical skills and ability to work with different biological samples and the ability to obtain 5 records, observe and analyze information in the laboratory.
Indicative Contents المحتويات الإرشادية	Developments in Genetic engineering technologies; selection of producer organisms; genetic manipulation of producer; cloning technology for heterologous gene expression; recombinant expression systems.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	This course covers the concepts and principles of genetic engineering, and includes a combined approach utilizing formal lectures, directed reading and tutorials for understanding the types of cloning and cloning vectors.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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	4% (4)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	3% (3)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	25% (25)	Continuous	All
	Report	1	3% (3)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Genetic Engineering
Week 2	Cloning Steps
Week 3	Isolation of total DNA

Week 4	Isolation of plasmid DNA
Week 5	Restriction enzymes
Week 6	Types of Restriction enzymes
Week 7	Mid-term Exam
Week 8	Factor affecting on restriction enzymes
Week 9	Cloning vectors
Week 10	Types of cloning vectors
Week 11	Plasmids
Week 12	Phages
Week 13	Cosmids
Week 14	Expression vectors
Week 15	Application of cloning vectors in genetic engineering
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	لمحاليل و البفرات
Week 2	ستخلاص الدنا الكلي من الكائنات بدائية النواة (البكتيريا)
Week 3	ستخلاص الدنا الكلي من الكائنات حقيقية النواة (دم الانسان)
Week 4	ستخلاص الدنا الكلي من الكائنات حقيقية النواة (النباتات)
Week 5	ستخلاص الدنا البلازميدي من الكائنات بدائية النواة (البكتيريا)
Week 6	قياس تركيز ونقاوة الدنا المستخلص
Week 7	لترحيل الكهربائي للدنا المستخلص
Week 8	لتقطيع واللحم
Week 9	دخال المادة الوراثية (التحول)
Week 10	**امتحان**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	An introduction to Genetic Engineering, Third Edition, Desmond S. T. Nicholl. (2008). CAMBRIDGE UNIVERSITY PRESS	Yes

Recommended Texts	- Principles of Gene Manipulation and Genomics. SEVENTH EDITION. S.B. Primrose and R.M. Twyman. 2006 - Introduction to biotechnology / William J. Thieman, Michael A. Palladino. -- 3rd ed. (2013) - Techniques in Genetic Engineering. Isil Aksan Kurnaz. (2015).	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	Food Microbiology	**Module Delivery**

Module Type	**Core**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	BioT-673		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		

Module Level	B	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Name ALI HAZEIM	**e-mail**	E-mail ali.hazim@uoanbar.edu.iq
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**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 Objectives أهداف المادة الدراسية	معرفه الإحياء المجهرية المسببة للتلف الغذائي ب – كيفية التعامل مع هذه الإحياء ج-تعريف الطالب كيفية التميز بين الأجناس والأنواع الميكروبية الملوثة د- التعرف على الإحياء المجهرية الداخلة في الاغذيه ه- تعريف الطالب بكيفية التعامل مع هذه الإحياء لخدمة منتوج ما
Module Learning Outcomes	**تعريف الطالب بالمصطلحات العلمية الخاصة بالإحياء المجهرية الصناعية والغذائية وكيفية كتابة الأسماء العلمية لها** **تعريف الطالب كيفية التعامل مع مسببات التلف الغذائي الناتجة بسبب الإحياء المجهرية**

مخرجات التعلم للمادة الدراسية	تعريف الطالب كيفية استعمال الإحياء المجهرية في الصناعات الغذائية
Indicative Contents المحتويات الإرشادية	**تشمل مجموعة متنوعة من المواضيع والمفاهيم التي تتعلق بالأحياء المجهرية في السياق الغذائي. قد تشمل بعض المحتويات الإرشادية التالية:** **تعريف الأحياء المجهرية الغذائية:** **مفهوم الأحياء المجهرية الغذائية وأهميتها في علم التغذية.** **التعرف على الأحياء المجهرية الهامة في الغذاء، مثل البكتيريا والفطريات.** **تأثير الأحياء المجهرية على الغذاء:** **دراسة دور الأحياء المجهرية في تحضير وتلف الأطعمة.** **فهم تأثير الأحياء المجهرية على النكهة والعفونة والتحويلات الكيميائية في الغذاء.** **الأحياء المجهرية والجهاز الهضمي:** **دراسة الأحياء المجهرية المفيدة في الجهاز الهضمي، مثل البكتيريا المعوية المفيدة.** **فهم تأثير الأحياء المجهرية على هضم وامتصاص المواد الغذائية.** **الأحياء المجهرية والمحافظة على الغذاء:** **دراسة استخدام الأحياء المجهرية في تقنيات مختلفة**

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	**الاستراتيجية الرئيسية التي ستعتمد في تقديم هذه المادة هي تشجيع مشاركة الطلاب في التمارين، مع تنمية وتوسيع مهارات التفكير النقدي لديهم في نفس الوقت. سيتم تحقيق ذلك من خلال الحصص الدراسية والحصص التعليمية التفاعلية وعن طريق اعتماد أنواع من التجارب البسيطة التي تنطوي على بعض الأنشطة العينية التي تكون مثيرة للاهتمام للطلاب.**

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

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

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: General instructions within the food microbiology laboratory
Week 2	Lab 2:Methods for Microbiological Examination of Foods
Week 3	Lab 3:Study of the microbiology of milk
Week 4	Lab 4: Study of the microbiology of cheese
Week 5	Lab 5:study of the microbiology of red meat and chicken
Week 6	Lab 6: Study of the microbiology of fish
Week 7	Lab 7: Study of the microbiology of fruits and vegetables
Week 8	Lab 8: Study of microbiology in eggs
Week 9	Lab 9: Study of microorganisms in pickles and sugary foods
Week 10	Lab 10: Study of microorganisms in canned food
Week 11	Lab 11: Study of the microbiology of bread and cereals

Learning and Teaching Resources
مصادر التعلم والتدريس

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

Grading Scheme
مخطط الدرجات

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

(0 – 49)	**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	**منهج البحث العلمي**	**Module Delivery**	
Module Type	**Support**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**ScMath 1302**		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		

Module Level	3	**Semester of Delivery**	6
Administering Department	Math	**College**	Sc
Module Leader	أم.د. فلاح دحام رشيد	**e-mail**	Dr.falah@uoanbar.edu.iq
Module Leader's Acad. Title	استاذ مساعد	**Module Leader's Qualification**	دكتوراه
Module Tutor	/	**e-mail**	/
Peer Reviewer Name	/	**e-mail**	/
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 Objectives أهداف المادة الدراسية	1-تعريف الطالب الباحث بمفهوم البحث العلمي والطريقة العلمية في اجراء البحث. 2-إكساب الطالب الباحث الكفاية في تحديد عنوان ومشكلة واهداف وفرضيات البحث العلمي ومجالاته. 3-تعريف الطالب الباحث بتصنيفات البحوث من حيث أهدافها و مناهجها 4-تعريف الطالب الباحث بمفهوم الاقتباس ووظائفه وقواعده وانواعه وطريقة كتابة النص المقتبس والاشارة الى المصادر 5-تعريف الطالب الباحث بطرق المعاينة وأساليب الاحصاء في البحث العلمي. 6-تعويد الطالب الباحث على إتباع الأساليب و القواعد العلمية المعتمدة في كتابة البحوث والتقارير.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادرا على: 1-التعرف على مفهوم البحث العلمي وانواعه، اهدافه، خصائصه، مستلزماته 2-التعرف على مفهوم الباحث العلمي وصفاته واهمية اجراء البحوث العلمية للافراد 3- التعرف على عنوان ومشكلة واهداف وفرضيات البحث العلمي ومجالاته 4-التعرف على الاطار النظري والدراسات السابقة 5-التعرف على الاقتباس ووظائفه وقواعده وانواعه وطريقة كتابة النص المقتبس والاشارة الى المصادر 6-التعرف على مناهج البحث العلمي 7-التعرف على مجتمع وعينة البحث 8-التعرف على الاحصاء في البحث العلمي 9-التعرف على اصول كتابة البحث العلمي ومكونات تقرير البحث
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الإرشادي ما يلي: الفصل الاول : البحث العلمي يتعرف الطالب في هذا الفصل على مفهوم البحث العلمي، انواعه، اهدافه، خصائصه، ومستلزماته. 4 ساعات الفصل الثاني : عنوان ومشكلة واهداف وفرضيات البحث العلمي ومجالاته يتعلم الطالب في هذا الفصل على كيفية صياغة عنوان البحث ومميزاته والتعريف بمقدمة البحث واهميته كذلك يتعرف الطالب في هذا الفصل على مشكلة البحث ومصادر اختيارها ومعايير صياغتها . 4 ساعات الفصل الثالث : مناهج البحث العلمي يتعرف الطالب من خلال هذا الفصل على تصنيف مناهج البحث العلمي والتعريف بكل منهج من المناهج المتبعة في البحوث العلمية. 4 ساعات الفصل الرابع : مجتمع وعينة البحث

	يتعرف الطالب في هذا الفصل على مجتمع الدراسة واسلوب العينة ومفهومها وكيفية تحديد حجم العينة وشروطها وخطوات اختيارها فضلا عن تقسيم العينات الى مجموعتين تضم كلا منهم العينات غير الاحتمالية والعينات الاحتمالية. 4 ساعات الفصل الخامس : الاحصاء في البحث العلمي يتعلق هذا الفصل بالتعريف بالاحصاء واقسامه وانواع البيانات ونبذة مختصرة عن نظام Spss. 4 ساعات

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1-عرض المادة الدراسية بواسطة الوسائط الإلكترونية المتعددة والمختلفة. 2-الوقوف على المسائل المتصلة بمدى صلاحية المنهج العلمي التجريبي في دراسة الظواهر العلمية. 3-مناقشة وطرح أفكار بحثية في اعداد التقارير.

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	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	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**	2	10% (10)	5 and 10		
	Assignments	2	10% (10)	2 and 12		
	Projects / Lab.					
	Report	1	10% (10)	13		
Summative assessment	**Midterm Exam**	2hr	20% (10)	7		
	Final Exam	3hr	50% (50)	16	All	
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	مفهوم البحث العلمي وانواعه، اهدافه، خصائصه، مستلزماته
Week 2	مفهوم الباحث العلمي وصفاته واهمية اجراء البحوث العلمية للافراد
Week 3	عنوان ومشكلة واهداف البحث العلمي
Week 4	فرضيات البحث العلمي ومجالات
Week 5	لاطار النظري والدراسات السابقة
Week 6	مفهوم الاقتباس ووظائفه وقواعده وانواعه
Week 7	طريقة كتابة النص المقتبس
Week 8	طريقة الاشارة الى المصادر
Week 9	مناهج البحث العلمي/ المنهج المسحي الوصفي
Week 10	مناهج البحث العلمي/ المنهج التجريبي
Week 11	مناهج البحث العلمي/ المنهج المقارن
Week 12	مناهج البحث العلمي/ المنهج التاريخي
Week 13	مجتمع وعينة البحث
Week 14	لاحصاء في البحث العلمي
Week 15	صول كتابة البحث العلمي ومكونات تقرير البحث
Week 16	سبوع مراجعة قبل الامتحان النهائي

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	عبد الجبار سعيد محسن. مباديء البحث العلمي. عمان: دار المناهج للنشر والتوزيع، 2023	Yes
Recommended Texts	عامر قنديلجي وايمان السامرائي. البحث العلمي الكمي والنوعي. عمان: دار اليازوردي، 2009	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.

This section includes a description of the module, 100-150 words

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Medical plant**		**Module Delivery**		
Module Type	**Core**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**		
Module Code	**BioT-683**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	B		**Semester of Delivery**	2	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Mustafa Riyadh Muhammed		**e-mail**	ag.mustafa.riyadh@uoanbar.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Objectives أهداف المادة الدراسية	1. Understanding plant-based medicine: Gain a comprehensive understanding of the principles and practices of herbal medicine and plant-based remedies. 2. Botanical knowledge: Acquire knowledge about different medicinal plants, including their botanical characteristics, taxonomy, morphology, and plant parts used for medicinal purposes. 3. Phytochemistry: Explore the chemical constituents present in medicinal plants and their pharmacological properties. Learn about active compounds, such as alkaloids, flavonoids, terpenes, and phenols, and their therapeutic effects. 4. Medicinal plant identification: Develop skills in identifying and classifying medicinal plants based on their visual characteristics, including leaves, flowers, stems, and fruits. 5. Traditional medicinal systems: Study traditional medicinal systems like Ayurveda, Traditional Chinese Medicine, and Indigenous healing practices, which extensively utilize medicinal plants. Understand the principles and philosophies behind these systems. 6. Medicinal plant cultivation: Learn the techniques and best practices involved in cultivating medicinal plants, including seed germination, propagation, cultivation conditions, and harvesting methods. 7. Therapeutic applications: Explore the various therapeutic applications of medicinal plants, such as their use in treating specific diseases, managing symptoms, promoting wellness, and supporting overall health. 8. Safety and precautions: Understand the potential risks, interactions, contraindications, and adverse effects associated with using medicinal plants. Learn about appropriate dosage, preparation methods, and precautions for safe usage. 9. Research and evidence-based practices: Familiarize yourself with research methodologies and scientific studies conducted on medicinal plants. Learn how to critically evaluate and interpret scientific literature related to herbal medicine. 10. Sustainability and conservation: Recognize the importance of sustainable practices in the collection, cultivation, and preservation of medicinal plants. Understand the significance of biodiversity conservation to ensure the availability of medicinal plant resources for future generations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge of Medicinal Plants: Gain knowledge about different medicinal plants, their identification, classification, and properties, including their active compounds and traditional uses. 2. Understanding Medicinal Plant Chemistry: Understand the chemical composition of medicinal plants, including the identification and analysis of bioactive compounds present in them. 3. Pharmacological Properties: Acquire knowledge about the pharmacological properties of medicinal plants, including their therapeutic effects, mechanisms of action, and potential side effects. 4. Cultivation and Harvesting: Learn about the cultivation techniques and proper harvesting methods of medicinal plants to ensure their quality and sustainability. 5. Herbal Medicine Preparation: Develop skills in preparing herbal medicines

	using medicinal plants, including extraction methods, formulation, dosage forms, and quality control. 6. Traditional and Contemporary Uses: Explore the traditional uses of medicinal plants in different cultures and societies, as well as their contemporary applications in herbal medicine, dietary supplements, and complementary therapies. 7. Safety and Regulatory Considerations: Understand the safety issues related to the use of medicinal plants, including potential interactions with medications, proper dosing, and adherence to regulatory guidelines and quality standards. 8. Research and Evaluation: Develop the ability to critically evaluate scientific literature and research studies related to medicinal plants, including assessing the efficacy, safety, and quality of herbal products. 9. Ethical and Sustainable Practices: Gain an understanding of ethical considerations in the use of medicinal plants, including sustainable sourcing, conservation, and cultural respect. 10. Integration of Knowledge: Apply knowledge of medicinal plants in the context of healthcare, including understanding their role in disease prevention, treatment, and health promotion.
Indicative Contents المحتويات الإرشادية	1. Introduction to Medicinal Plants: • Definition and importance of medicinal plants • Historical perspectives on herbal medicine • Cultural and traditional uses of medicinal plants 2. Botany and Taxonomy of Medicinal Plants: • Plant anatomy and morphology • Classification and taxonomy of medicinal plants • Identification techniques and key characteristics 3. Phytochemistry and Pharmacognosy: • Introduction to phytochemicals • Active constituents and their properties • Extraction, isolation, and analysis of plant compounds • Pharmacognostic evaluation of medicinal plants 4. Medicinal Plant Cultivation and Propagation: • Plant propagation methods (seeds, cuttings, grafting, etc.) • Cultivation techniques and requirements • Good Agricultural and Collection Practices (GACP) • Conservation and sustainable harvesting of medicinal plants 5. Traditional Medicinal Systems: • Overview of traditional medicinal systems (e.g., Ayurveda, Traditional Chinese Medicine, Indigenous healing) • Principles and concepts of traditional medicine • Formulation and preparation of herbal remedies 6. Therapeutic Uses of Medicinal Plants: • Common ailments and conditions treated with medicinal plants • Herbal formulations and dosage forms (teas, tinctures, capsules, etc.) • Evidence-based uses and clinical studies • Complementary and alternative medicine approaches 7. Safety, Toxicity, and Quality Control: • Safety considerations and potential adverse effects • Drug-herb interactions and contraindications • Quality control and standardization of herbal products • Regulatory aspects and legal considerations 8. Research Methodology in Medicinal Plants:

	• Experimental design and methodology for herbal research • Bioassays and in vitro testing • Clinical trials and evidence-based medicine • Ethnobotanical surveys and fieldwork 9. Medicinal Plant Database and Information Sources: • Online databases and resources for medicinal plants • Scientific journals and publications in the field • Ethnobotanical databases and traditional knowledge repositories 10. Case Studies and Practical Applications: • Case studies highlighting the use of specific medicinal plants • Practical exercises on plant identification, collection, and preparation • Formulation and development of herbal products • Field visits and hands-on experiences with medicinal plants

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Medicinal Plants: • Definition and importance of medicinal plants • Historical use of medicinal plants • Current trends and research in medicinal plants
Week 2	Plant Anatomy and Morphology: • Structure and parts of plants (roots, stems, leaves, flowers, fruits) • Plant cell structure • Tissues and organs in plants • Plant reproductive structures
Week 3	Plant Taxonomy and Classification: • Classification systems for plants • Taxonomic hierarchy (kingdom, division, class, order, family, genus, species) • Plant identification and nomenclature
Week 4	Phytochemistry: • Secondary metabolites in plants • Phytochemical analysis techniques • Major classes of plant compounds (alkaloids, flavonoids, terpenoids, etc.) • Chemical diversity and variability in medicinal plants
Week 5	Plant Pharmacology: • Pharmacological properties of medicinal plants • Active compounds and their mechanisms of action • Bioavailability and pharmacokinetics of plant compounds • Pharmacodynamic interactions and synergistic effects
Week 6	1. Ethnobotany and Traditional Medicine: • Traditional knowledge and cultural significance of medicinal plants • Ethnobotanical surveys and documentation • Indigenous healing practices and traditional medicine systems • Ethical considerations and intellectual property rights
Week 7	1. Medicinal Plant Conservation and Sustainable Harvesting: • Conservation strategies for endangered medicinal plants • Sustainable harvesting practices • Cultivation and propagation of medicinal plants • Conservation laws and regulations

Week 8	Herbal Medicine Preparation and Formulation: • Extraction techniques (maceration, infusion, decoction, etc.) • Standardization and quality control of herbal preparations • Formulation development (capsules, tinctures, ointments, etc.) • Dosage forms and administration routes
Week 9	1. Herbal Safety and Toxicology: • Adverse effects and toxicity of medicinal plants • Pharmacovigilance and monitoring of herbal products • Drug-herb interactions and contraindications • Regulatory guidelines for herbal safety assessment
Week 10	Research Methodology in Medicinal Plants: • Experimental design in medicinal plant research • Data collection and analysis techniques • Clinical trials and preclinical studies • Ethnopharmacological research methods
Week 11	Traditional Medicinal Systems: • Overview of different traditional medicinal systems (e.g., Ayurveda, Traditional Chinese Medicine, Indigenous healing practices) • Principles and philosophies underlying traditional medicine • Key herbs and formulations used in traditional medicinal systems • Integration of traditional knowledge into modern healthcare practices
Week 12	Medicinal Plants in Specific Therapeutic Areas: • Exploration of medicinal plants used in specific therapeutic areas (e.g., respiratory disorders, digestive disorders, cardiovascular health) • Case studies highlighting the efficacy of medicinal plants in treating specific conditions • Mechanisms of action and evidence-based research supporting their therapeutic use
Week 13	14. Biotechnological Approaches in Medicinal Plant Research: • Introduction to biotechnological tools and techniques in medicinal plant research • Plant tissue culture and its applications in mass propagation and production of secondary metabolites • Genetic engineering and metabolic engineering for enhanced biosynthesis of medicinal compounds • Biotechnological advancements in plant conservation and preservation of rare medicinal plants
Week 14	Herbal Drug Development and Regulation: • Overview of the drug development process for herbal products • Regulatory frameworks and guidelines governing the production, quality, and safety of herbal medicines • Clinical trials and evidence-based evaluation of herbal drugs • Challenges and future prospects in herbal drug development
Week 15	**Medicinal Plants in Specific Therapeutic Areas:** • **Exploration of medicinal plants used in specific therapeutic areas (e.g., respiratory disorders, digestive disorders, cardiovascular health)** • **Case studies highlighting the efficacy of medicinal plants in treating specific conditions** • **Mechanisms of action and evidence-based research supporting their therapeutic use**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Antimicrobial activity: Test the antimicrobial activity of plant extracts against bacteria or fungi using agar diffusion or broth dilution methods. Measure the zone of inhibition or determine the minimum inhibitory concentration (MIC)
Week 2	Lab 2: Extraction of plant compounds: Extract bioactive compounds from a medicinal plant using suitable extraction techniques, such as maceration or Soxhlet extraction.
Week 3	Lab 3: Measuring the rate of respiration in germinating seeds versus non-germinating seeds using a respirometer.
Week 4	Lab 4: Antioxidant activity: Assess the antioxidant activity of plant extracts using assays
Week 5	Lab 5: Cytotoxicity evaluation: Investigate the cytotoxic effects of plant extracts on cancer cells
Week 6	Lab 6: Anti-inflammatory activity: Evaluate the anti-inflammatory potential of plant extracts
Week 7	Lab 7: Enzyme inhibition: Determine the inhibitory effect of plant extracts on specific enzymes, such as acetylcholinesterase or alpha-amylase, using enzymatic assays.
Week 8	Lab 7: Phytochemical screening: Perform qualitative tests to identify the presence of various secondary metabolites in plant extracts, including alkaloids, flavonoids, tannins, terpenoids, and saponins.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Medicinal Plants of the World Volume 1: Chemical Constituents, Traditional and Modern Medicinal Uses	Yes
Recommended Texts	A Practical Approach Copyright Year: 2003, dissidents.	No
Websites	https://link.springer.com/book/10.1007/978-1-59259-365-1	

Grading Scheme
مخطط الدرجات

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