جمهورية العراق
وزراة التعليم العالي والبحث العلمي
جامعة المستقبل
كلية العلوم
قسم التقنيات الاحيائية الطبية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Industrial Microbiology			**Module Delivery**	
Module Type	Core			☒**Theory** ☐**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	**UOMU0307053**				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	3		**Semester of Delivery**	5	
Administering Department	Medical biotechnology		**College**	Sciences	
Module Leader	Mohammed Zuhair Naji		**e-mail**	Mohammed.zuhair.naji@uomus.edu.iq	
Module Leader's Acad. Title			**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			**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Medical microbiology, General microbiology	**Semester**	3, 4
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Isolation of microorganisms that related to industrial field. 2. Purification of microorganisms. 3. do synergistic test between microorganisms and selecting the strongest of them for the purpose of adopting them in the field of industrial microorganisms 4. Learn about some industries that are sourced from microorganisms such as penicillin and citric acid 5. multiply these microorganisms and preserve them for the purpose of commercial production 6. Teaching students some experiments on some well-known and industrially famous microorganisms, such as Bacillus and E. coli. 7. Identifying some industrial microorganisms related to the manufacture of vitamins 8. Identify the microorganisms that produce vitamins 9. The role of industrial microorganisms in the dairy industry 10. The role of Microorganism in fermentation, Foods and Biofuels
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Give an introduction of industrial microbiology 2. Importance of microorganisms either it is medical or food microorganism in indusrial field. 3.Learn the student about some laboratory applications related to industrial microorganisms 4.Explain the importance of some industrial microorganisms 5.Make the student graduate with a good score in the field of industrial microbiology. 6. Proliferation of some industrial microorganisms inside the laboratory by the student and knowing their characteristics and advantages. 7. Teaching the student some techniques of industrial microbiology, such as the technique of insulin production.

	8. Manipulating the nutritional environment of the microorganism to detect some metabolites and study their industrial importance
Indicative Contents المحتويات الإرشادية	In lecture lab #1-#5 they will need (15hr). In lecture lab #7- #13 they will need (60 hr). In lecture lab #15 they will need (10hr).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The Industrial Microbiology in this course is designed to help the student plan and teach how bacteria is used in the production of certain foods and aid in industry many of food products. The video lessons, quizzes and transcripts can easily be adapted to provide student lesson plans with engaging and dynamic educational content. Make planning student course easier by using our syllabus as a guide

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**	3	10	4, 6, 10	#1 and#2, #3-#5, #9
	Assignments	2	10	13 and 14	#1 and #12
	Projects / Lab.	1	10	continuous	all
	Report	1	10	15	#14
Summative assessment	**Midterm Exam**	2h	10	7	#1-#6, #8-#14
	Final Exam	3h	50	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction in industrial microorganisms
Week 2	Microorganisms in vitamins production
Week 3	Microbial productions of antibiotics
Week 4	Microbial production of enzymes
Week 5	Role of Microorganisms in dairy products
Week 6	Mid exam
Week 7	Microorganisms in organic acid production
Week 8	Microorganisms in single cell protein production
Week 9	Microbial fermentations, Foods and Biofuels
Week 10	Microbial fermentations, Foods and Biofuels

Week 11	Role of Microorganisms in Elemental Cycles
Week 12	Microorganisms in hydrolysis of hydrocarbon
Week 13	Petroleum and Marine Microbiology
Week 14	Role of microorganism in Bioleaching and Textile Industry
Week 15	Define of industrial microorganisms
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Isolation of industrial microorganisms
Week 2	Isolation of microorganisms of antibiotics
Week 3	Isolation of microorganisms of enzymes production
Week 4	Isolation of microorganisms of enzymes production
Week 5	Mid exam
Week 6	Detection of antibiotic in actinomyces bacteria
Week 7	Isolation of hydrocarbon degrading microorganisms
Week 8	Isolation of hydrocarbon degrading microorganisms
Week 9	Isolation of plastic degrading microorganisms
Week 10	Determination of oil and grease from industrial waste.
Week 11	Detection of penicillin in molds
Week 12	Detection of ethanol production by microorganisms
Week 13	Isolation of Vit B12 requiring mutants of E. coli using UV
Week 14	Isolation of yeasts
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**1) KOLHAPUR(2012) SHIVAJI UNIVERSITY, Industrial Microbiology** 2) Casida,L.E.,1984, Industrial Microbiology. Wiley Eastern, New Delhi 3) Aiba, Shuichi, 1973, Biochemical Engineering, 2nd Ed. Academic Press	
Recommended Texts	Okafor, N., & Okeke, B. C. (2017). Modern industrial microbiology and biotechnology. CRC Press.	
Websites	related scientific papers, https://www.researchgate.net/publication/289980213	

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.