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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Genetic engineering**	**Module Delivery**	
Module Type	Core	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOMU0307052**		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Sciences
Module Leader	Sarah Kamil Abbood	**e-mail**	
Module Leader's Acad. Title	Assistance professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail sarah.kamil@uomus.edu.iq
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	MBT-24018	**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The goal of this course is to introduce students principles, tools and methodology of genetic engineering
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After successful completion of the course, the student will be able to: 1- Define relevant terms, tools and concepts of genetic engineering 2- Explain the methodologies of gene isolation and manipulation 3- Identify the elements of cloning procedure and discuss their implementation for various conditions 4- Describe the methods of screening and analysis of recombinant DNA and its product 5- Design cloning strategies for recombinant DNA and implement associated bioinformatics tools.
Indicative Contents المحتويات الإرشادية	Student responsibilities: 1. Study of course materials as specified by the instructor 2. Timely submission of given class assignment

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lecturing. Problem solving. Classroom discussions

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	61	**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**	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	**Midterm**	2h	10	7	#1-#6, #8-#14

assessment	**Exam**				
	Final Exam	3h	50	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction**
Week 2	**Recombinant DNA: Historical perspective and early experiment**
Week 3	**In vivo gene construction, Gene transfer in nature; interspecies gene transfer.**
Week 4	**Restriction Enzymes and polymerases**
Week 5	**Types of plasmids**
Week6	**Bacteriophage as cloning vector**
Week 7	**Host cells and vectors**
Week 8	**Mid-term Exam**
Week 9	**Cloning Strategies**
Week 10	**Selection Screening and Analysis of recombinants-1**
Week 11	**Selection Screening and Analysis of recombinants-2**
Week 12	**Genetic Engineering in action: Human genome**
Week 13	**Genetic engineering and biotechnology**
Week 14	**CRISPR Technology**
Week 15	**Transgenic plant**
Week 16	**Transgenic animal**
Week 17	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Introduction**
Week 2	**Isolation of Genomic DNA from Plant**
Week 3	**Isolation of Genomic DNA from microorganisms**
Week 4	**Isolation and Visualization of Plasmids**
Week 5	**Agarose Gel Electrophoresis**
Week 6	**Mid-term Exam**

Week 7	**Restriction Digestion of Plasmid DNA**
Week 8	**Preparation of competent cells (*E.coli*)**
Week 9	**PCR**
Week 10	**RFLP technique -1**
Week 11	**RFLP technique -2**
Week 12	**Review**
Week 13	**Final exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Gene Cloning - An introduction, T.A. Brown. Van Reinhold, 1988. 2. Recombinant DNA - Watson JD, Gilman M, Witkowski J and Zoller M, 1992. Second Ed. Scientific American Books. 3. DNA Cloning I and II, D.M. Glover and B.D. Hames, 1995. IRL press. 4. Genetic Engineering - An introduction, D.S.T. Nicholl. 5. Principles of Gene Manipulation, R.N.Old and S.B. Primrose, l994. Blackwell Publishers, New York.	
Recommended Texts	• **Gene Cloning and DNA Analysis: An Introduction.** • **Biotechnology: Applying the Genetic Revolution.** • **Principles of Gene Manipulation and Genomics.** • **Molecular Cloning: A Laboratory Manual.** • **Prescott/Harley/Klein's Microbiology.** • **Genomes 3**	
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.