Course Description Form

1. Course Name:
Biotechnology 2
2. Course Code:
BIOTE472
3. Semester / Year:
First semester (fall) / 2024 – 2025
4. Description Preparation Date:
1 / 2 / 2025
5. Available Attendance Forms:
Presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical hours + 3 practical hours (75 hours) / 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr.Tariq Nawaf Khalil and Tamadhr Turky
8. Course Objectives

Theoretical: The student learns about production methods an compounds that can be produced by industrial microorganisms - Methods of fixing cells and free and bound cells	practical : Introducing the student to the important life applications of biotechnology Enabling the student to use simple raw materials operations Productivity Crystallizing new ideas regarding the use of microscopic organisms It has become possible and an alternative to productive factories that serve Sustainable development goals if exploited prope Production of many important materials in the fo industry Pharmaceutical and cosmetic laboratory
9. Teaching and Learning Strategies	
Theoretical - Interactive lecture - Brainstorming - Dialogue and discussion - Assigning reports -Conducting monthly and daily examinations	Practical Interactive lecture -Discussion, dialogue, brainstorming -Conducting laboratory experiments -Assigning reports -Conducting daily and monthly examinations

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production Practical : a 1) The student learns about the fields of biotechnology and the environmental factors of production	Theoretical Production of bread yeast Practical : Enzyme production	Theoretical : audio methods, Writing on the boa Direct dialogue sty Practical : Assigr tasks and reports	Shortexams, assignments, discussions
2	2Theoretical 3Practical	Theoretical : b 1) The student explains the relationship between producing organisms and the work environment in production process Practical : c 1) The student experiments with differe production techniques.	Theoretical : Production o organic acids Practical : Enzyme production	Theoretical : audio methods, Writing on the boa Direct dialogue style Practical : Assigr tasks and reports	Shortexams, assignments, discussions
3	2Theoretical 3Practical	Theoretical : b 1) The student explains the relationship between producing organisms and the work environment in production process Practical: c1) The student experim withdifferent produc techniques.	Theoretical: Production of amino acids Practical : Production amino acids and single protein	Theoretical audio methods, Writing on the boa Direct dialogue style Practical Assigr tasks and reports	Shortexams, assignments, discussions
4	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production practical : c 1) The student experiments with differe production techniques.	Theoretical: preparing the vaccine Practical : Biomass production from Multiple carbon sources	Theoretical audio methods, Writing on the boa Direct dialogue style Practical Assigr tasks and reports	Shortexams, assignments, discussions
5	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production b 1) The student explains the relationship between producing organisms and the work environment in production process Practical : c 1) The student experiments with differe	Theoretical: Vitamin production practical Effect of carbon Source On biomass production	THEORETICAL audio methods, Writing on the boa Direct dialogue style PRACTICAL Assigning tasks and reports	Shortexams, assignments, discussions

		production techniques.			
6	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production Practical : d 1) The student writes a report on biotechnology.	Theoretical: Industrial alcohol production practical Field visits project	Theoretical aud methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports	Shortexams, assignments, discussions
7	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production b 1) The student explains the relationship between producing organisms and the work environment in production process Practical : c 1) The student experiments with differe production techniques. e 1) The student understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency	Theoretical: Enzyme production practical Lacticacid fermentations	Theoretical aud methods, Writing on the board Direct dialogue style practical Assigning tasks and reports	Shortexams, assignments, discussions
8	2Theoretical 3Practical	Theoretical : b 1) The student explains the relationship between producing organisms and the work environment in production process e 1) The student understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency Practical : c 1) The student experiments with differe production techniques.	Theoretical: Estimating enzymes and measuring th effectiveness Practical : Lactic acid fermentations	THEORETICAL audio methods, Writing on the board Direct dialogue style Practical Assigning tasks and reports	Shortexams, assignments, discussions
9	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production e 1) The student	Theoretical: Antibiotic production Practical: Restriction of ce	Theoretical audio methods, Writing on the boa Direct dialogue style Practical : Assigr tasks	Shortexams, assignments, discussions

		understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency Practical : c 1) The student experiments with differe production techniques.	and enzymes	and reports	
10	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production Practical : c 1) The student experiments with differe production techniques. e 1) The student understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency	Theoretical: Free and fixed cells and enzym Practical : Citric acid fermentations	Theoretical aud methods, Writing on the board Direct dialogue style Practical Assigning tasks and reports	Shortexams, assignments, discussions
11	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production e 1) The student understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency Practical : c 1) The student experiments with differe production techniques. e 1) The student understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency	Theoretical: Methods precipitation and purification of biotechnology produc Practical : Citric acid fermentations	Theoretical aud methods, Writing on the board Direct dialogue style Practical Assigning tasks and reports	Shortexams, assignments, discussions
12	2Theoretical 3Practical	Theoretical : a 1) The student learns about the fields of biotechnology and the	Theoretical: Estimating th outcomes of biotechnolog Practical : Solid state	Theoretical audio methods, Writing on the boa Direct dialogue	Shortexams, assignments, discussions

		environmental factors of production Practical : c 1) The student experiments with differe production techniques.	fermentations	Style Practical Assigr tasks and reports	
13	2Theoretical 3Practical	Theoretical : e 1) The student understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency Practical : c 1) The student experiments with differe production techniques.	Theoretical: Studying the effect of growth factors on industrial microorganisms Practical : Isolation of productive microorganism For antibiotics	Theoretical aud methods, Writing on the board Direct dialogue style Practical Assigning ta and reports	Shortexams, assignments, discussions
14	2Theoretical 3Practical	Theoretical : d 1) The student writes a report on biotechnology. Practical : c 1) The student experiments with differe production techniques.	Theoretical: a comprehensive Review practical Production of penici antibiotic	THEORETICAL audio methods, Writing on the board Direct dialogue style practical ssign tasks and repor	Shortexams, assignments, discussions
15	2Theoretical 3 practical	Theoretical : a 1) The student learns about the fields of biotechnology and the environmental factors of production d 1) The student writes a report on biotechnology. e 1) The student understands the importa of the interconnected relationship between the microorganism and its developmental condition and its impact on production efficiency Practical : a 1) The student learns about the fields of biotechnology and the environmental factors of production d 1) The student writes a report on biotechnology. e 1 The student understa the importance of the interconnected relationsl between the microorgani and its developmental conditions and its impact production efficiency	Theoretical: a comprehensive reviev Course review Practical Course review	Practical Oral questions (competition) practical experiences, Short test questions	discussions

11. Course Evaluation				
t	Evaluation methods	Evaluation date (one week)	Grade	Relative weight %
1	Final theoretical report + theoretical practical reports	Theoretical 15 weeks Practical 1-15 weeks	7theoretical + 6 practical	13%
2	Short test 1 Quiz	3 weeks	4theoretical + 2practical	6%
3	Midterm exam (theoretical and practical)	9 weeks	10theoretical + 5 practical	15%
4	Short test 2 Quiz	12 weeks	4 theoretical + 2 practical	6%
5	Final practical test	practical exams week	20	20%
6	Final theoretical exam	theoretical exams week	40	40%
			100	100

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Biotechnology book (Dr. Fayez Al-Ani), Biotechnology book Dr. Khafaji flower
Main references (sources)	(Sources) Biotechnology Book (Dr. Fayez Al-Ani)
Recommended books and references (scientific journals, reports...)	references (scientific journals, reports....)
Electronic References, Websites	Electronic references, Internet sites, Research gat

Theoretical subject teacher: Dr. Tariq Nawaf Khalil

Practical subject teacher : M.M. Tamadhr Turky

جامعة الموصل
كلية الزراعة والغابات
قسم علوم الاغذية

Chairman of the Scientific Committee : Assistant prof. Dr. Taha M. Taqi

Head of the Food Sciences Department : Assistant prof. Dr. Taha M. Taqi