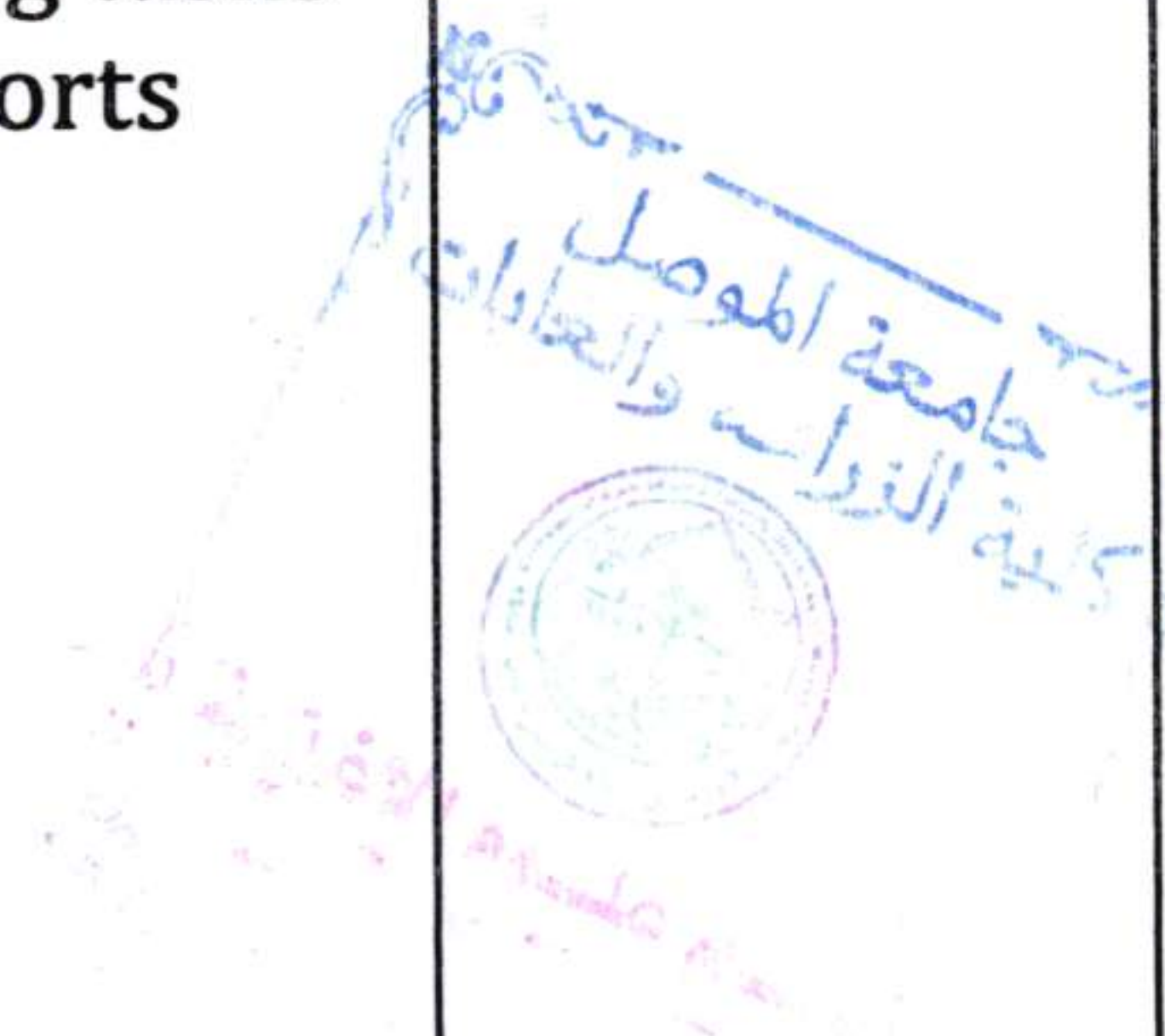
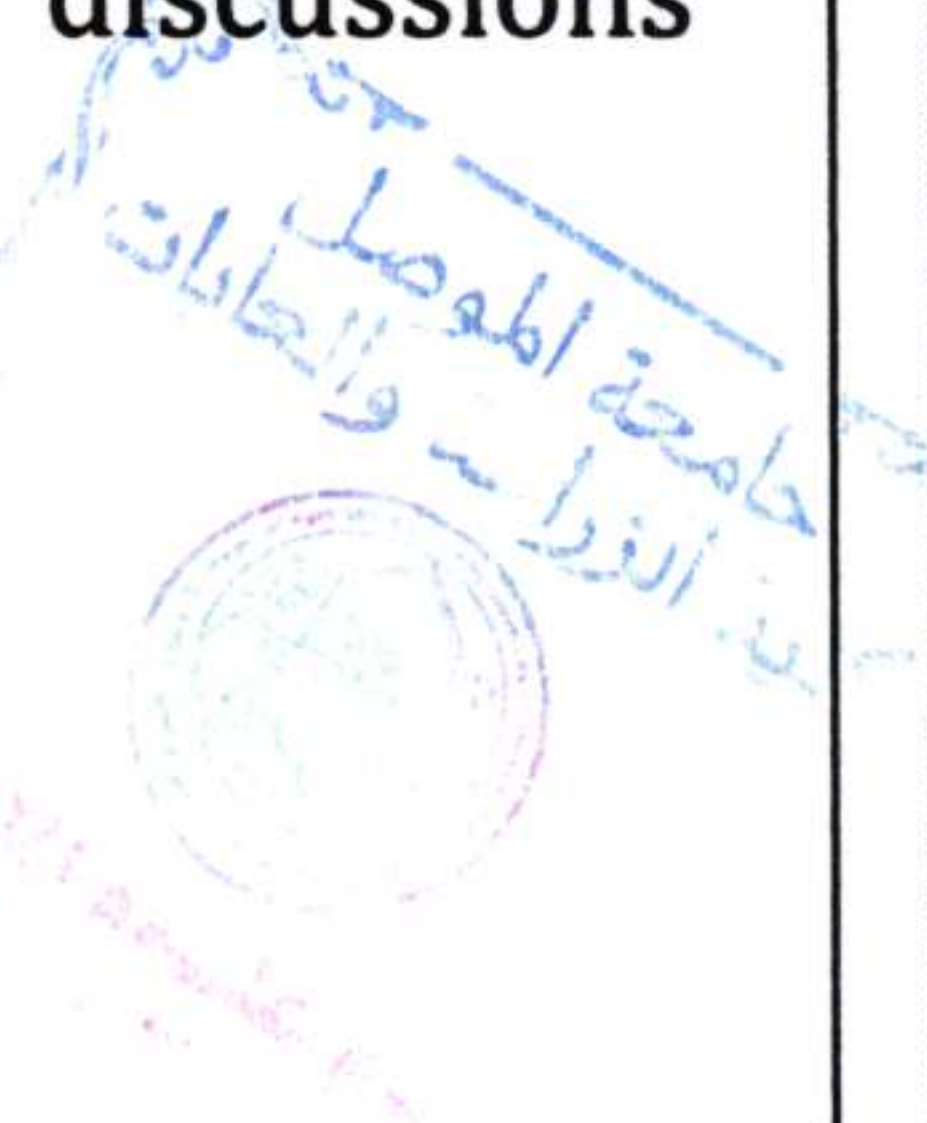
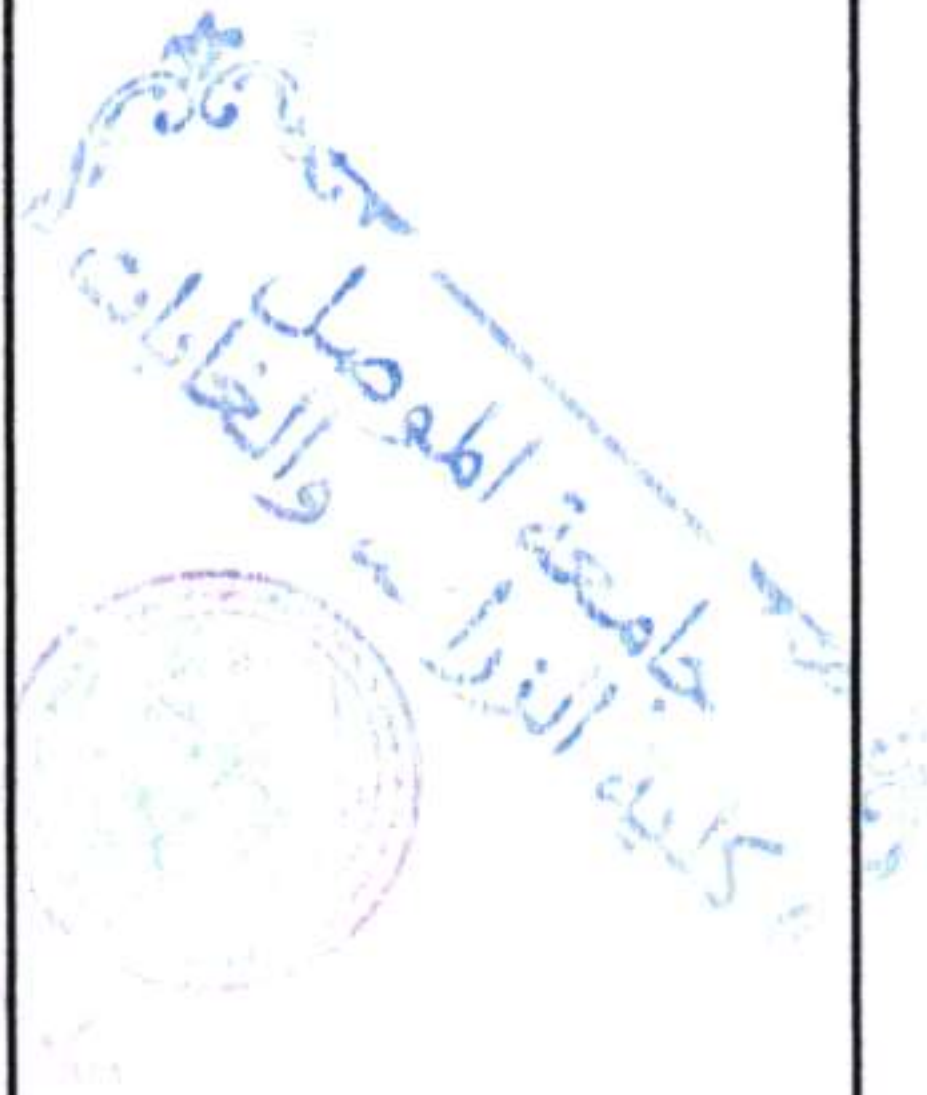


Course Description Form

| 1. Course Name: | | | | | |
|---|----------------------------|---|---|--|--|
| Biotechnology 1 | | | | | |
| 2. Course Code: | | | | | |
| BITE467 | | | | | |
| 3. Semester / Year: | | | | | |
| First semester (fall) / 2023-2024 | | | | | |
| 4. Description Preparation Date: | | | | | |
| 1/2/2024 | | | | | |
| 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 Nowaf Khalil and Enas Mounir Abdel Majeed | | | | | |
| 8. Course Objectives | | | | | |
| Theoretical - Enabling the student to know the definition of life technologies and industrial microbiology - Introducing the student to methods of developing and preserving industrial microorganisms - Introducing the student to methods of genetic engineering and methods of increasing the productive capacity of organisms | | | Practical - Enabling the student to isolate microorganisms from their sources, preserve them, and test their production capacity | | |
| 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:a1 The student learns the meaning of biotechnology And sources of | THEORETICAL Definition of biotechnology Cell types and sources of | THEORETICAL audio methods, Writing on the board Direct dialogue | Shortexams, assignments, discussions |

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|---|----------------------------|---|--|--|---|
| | | <p>biology</p> <p>practical a1 The student gets to know Biotechnology science And its importance in life Industrial microscopyit</p> | <p>microorganisms</p> <p>practical biotechnology And microbiology</p> | <p>style PRACTICAL Assigning tasks and reports</p> |  |
| 2 | 2Theoretical 3Practical | <p>Theoretical:c1 The student learns about the type of nutrients needed for the growth of microorganisms and the environment, such as temperature and pH.</p> <p>practical : c1 The student will be able to prepare the vital vaccine</p> | <p>THEORETICAL Nutritional and environmental requirements for the growth of microorganisms</p> <p>PRACTICAL Biovaccine</p> | <p>THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports</p> | <p>Shortexams, assignments, discussions</p> |
| 3 | 2Theoretical 3Practical | <p>THEORETICAL: c2 The student learns about the necessary metabolic pathways that microorganisms take to produce energy Practical : c2 The student gets to know Methods of preservation and the benefits of each Of which</p> | <p>THEORETICAL Metabolic pathways of microorganisms</p> <p>practical Different methods of preservation</p> | <p>THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports</p> | <p>Shortexams, assignments, discussions</p> |
| 4 | 2Theoretical 3Practical | <p>THEORETICAL: b1 The student learns about the fermentation device, its parts,</p> | <p>Theoretical: fermented</p> | <p>THEORETICAL audio methods, Writing on the board Direct dialogue</p> | <p>Shortexams, assignments, discussions</p> |

| | | | | | |
|---|----------------------------|--|--|---|--|
| | | and ways to work with it Practical : c3 The student was not able to run Lyophilization device and learning to preserve samples with it | practical Preservation by lyophilization | style PRACTICAL Assigning tasks and reports | |
| 5 | 2Theoretical 3Practical | Theoretical: c3 The student learns about development methods and methods, such as the continuous method, meals, and nutrition Practical : c4 The student is able to identify mutation events Using UV rays | Theoretical: Development methods used in biotechnology practical Creating mutations using ultraviolet radiation | THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports | Shortexams, assignments, discussions  |
| 6 | 2Theoretical 3Practical | Theoretical: d1 The student learns about methods of genetic engineering for industrial microorganisms, cutting and plasmid enzymes, and plasmids. Practical : b1 The student is able to operate the fermenter and become familiar with it On its parts | Theoretical: Genetic engineering of microorganisms practical Fermenter device | THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports | Shortexams, assignments, discussions |
| 7 | 2Theoretical 3Practical | Theoretical: b2The student learns about hybridization, mutation, and protoplast fusion | Theoretical: Genetic improvement of artificial microorganisms | THEORETICAL audio methods, Writing on the board Direct dialogue style | Shortexams, assignments, discussions |

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|----|------------------------------------|---|--|--|--|
| | | <p>Practical : b2 The student will be able to manufacture ethanol in the laboratory</p> | <p>practical Manufacture of ethanolic alcohol Laboratory</p> | <p>PRACTICAL Assigning tasks and reports</p> | |
| 8 | <p>2Theoretical 3Practical</p> | <p>Theoretical: a2 The student learns about the types of artificial microbial vaccines and methods of producing and activating them</p> <p>Practical : b3 The student will be able to manufacture ethanol in the laboratory</p> | <p>Theoretical: Industrial microbial vaccine production</p> <p>practical Manufacture of ethanolic alcohol Laboratory</p> | <p>THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports</p> | <p>Shortexams, assignments, discussions</p>  |
| 9 | <p>2Theoretical 3Practical</p> | <p>Theoretical: d2 The student learns about the mechanism of dealing with compounds and methods of chemical and physical separation</p> <p>Practical : c5 Preparing reports and discussing previous experiences</p> | <p>Theoretical: methods for separating biotechnology products</p> <p>practical discussion</p> | <p>THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports</p> | <p>Shortexams, assignments, discussions</p> |
| 10 | <p>2Theoretical 3Practical</p> | <p>Theoretical: a3 The student learns about methods of preserving artificial microorganisms and the duration of their preservation, such</p> | <p>Theoretical: Methods of preserving artificial microorganisms</p> | <p>THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports</p> | <p>Shortexams, assignments, discussions</p> |

| | | | | | |
|----|----------------------------|---|--|---|--------------------------------------|
| | | as freezing, cooling, lyophilization, etc. Practical : e1 The student will be able to prepare the manufacturing process for yeast | practical Laboratory manufacturing of bread yeast | | |
| 11 | 2Theoretical 3Practical | Theoretical: a4 The student learns about the type of protein, how microorganisms reproduce to be used as food materials for humans and animals, and ways to develop them. Practical : e2 The student will be able to prepare the manufacturing process for yeast | Theoretical: Single-cell protein production practical The student will be able to prepare the manufacturing process for yeast | THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports | Shortexams, assignments, discussions |
| 12 | 2Theoretical 3Practical | Theoretical: d3 The student learns about methods of protein separation and purification using gels, cycadics, and precipitation with solvents Practical : a2 Scientific visit | Theoretical: single-cell protein separation practical Scientific visit | THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports | Shortexams, assignments, discussions |
| 13 | 2Theoretical 3Practical | Theoretical: d4 The student learns about the microorganisms that produce toxins and the type of toxins Practical : c6 The student is able to separate bread yeast | Theoretical: Production of mycotoxins practical Separating and purifying bread yeast | THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports | Shortexams, assignments, discussions |

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|----|----------------------------|--|--|---|--------------------------------------|
| 14 | 2Theoretical 3Practical | Theoretical: b3 A comprehensive and quick review of all previous lectures is done Practical : c7 The student is able to separate bread yeast | Theoretical: a comprehensive review practical Separating and purifying bread yeast | THEORETICAL audio methods, Writing on the board Direct dialogue style PRACTICAL Assigning tasks and reports | Shortexams, assignments, 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 |

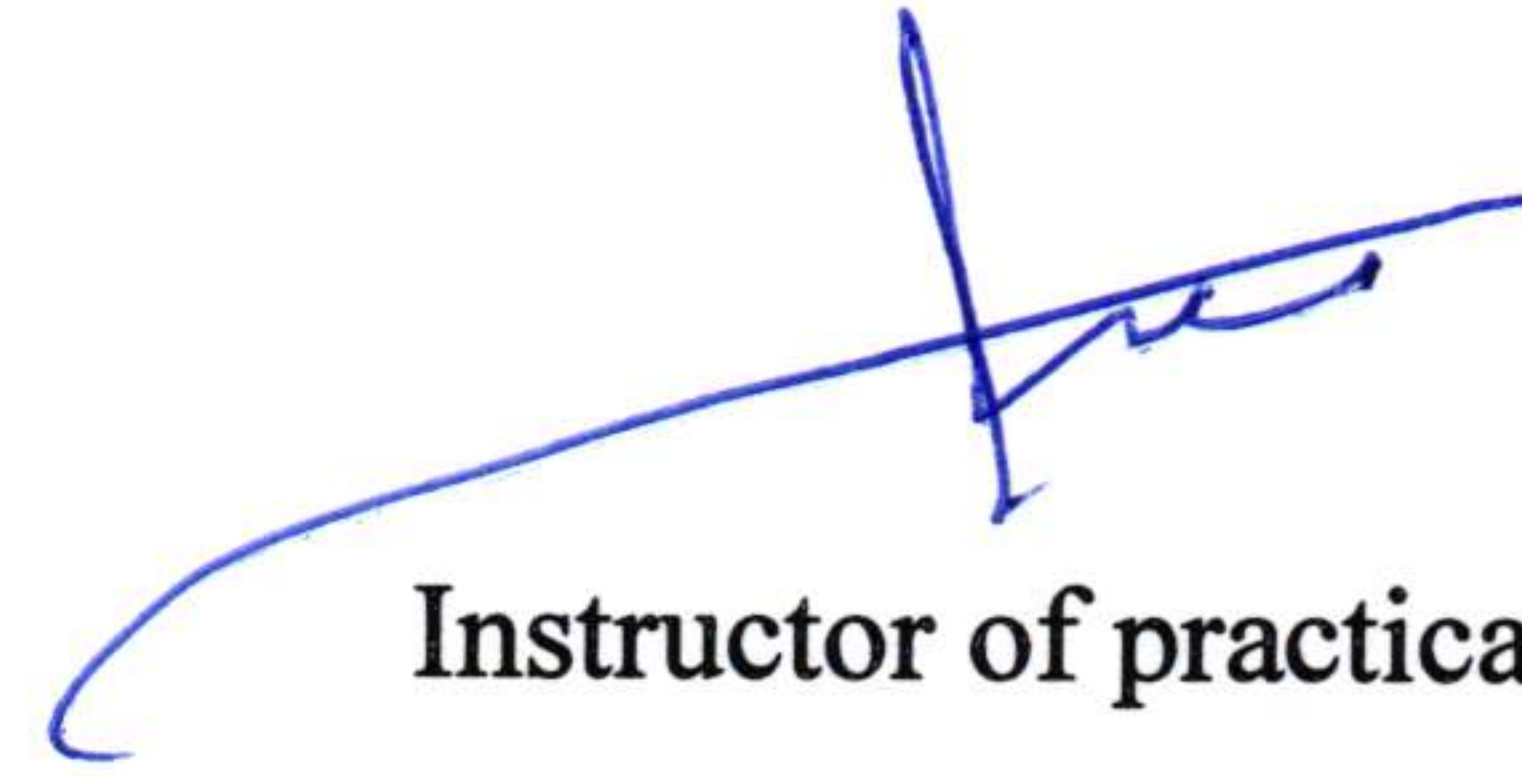
12. Learning and Teaching Resources

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|--|---|
| 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 |



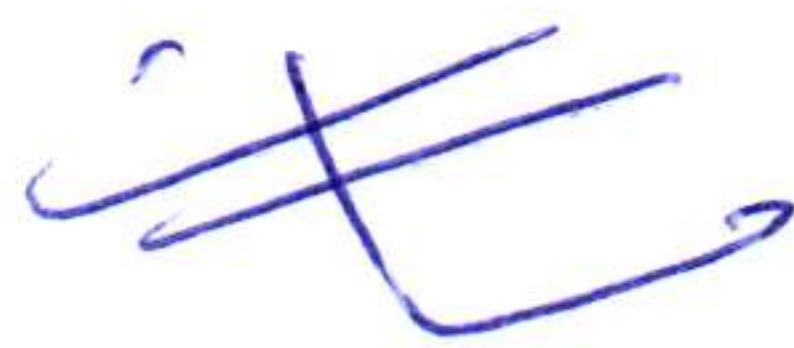
Instructor of theoritical part

Dr. Tariq Nawaf Khalil



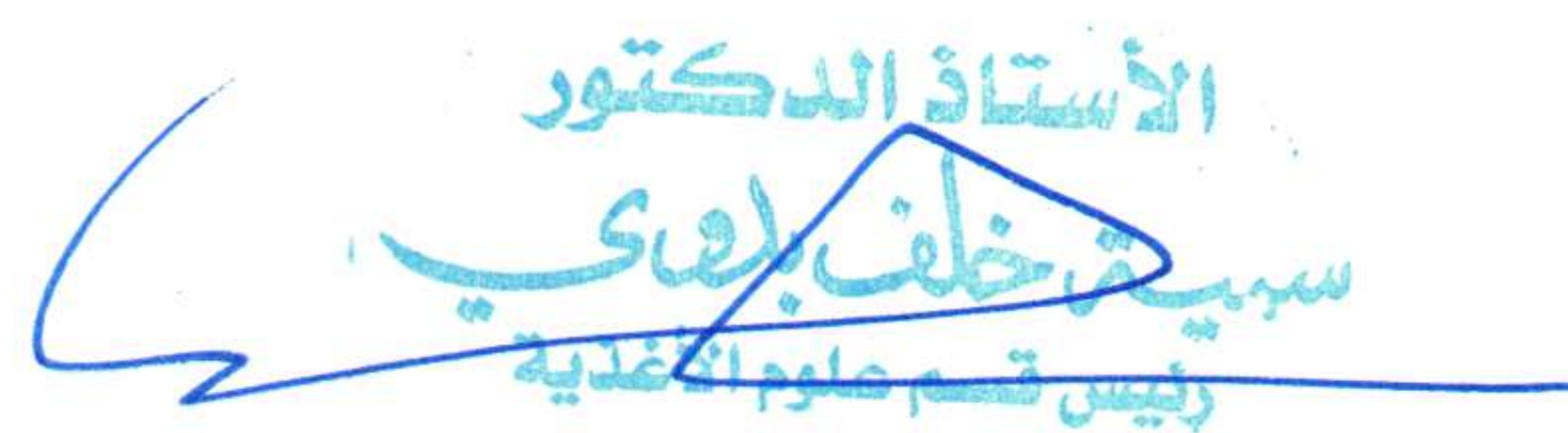
Instructor of practical part

Enas Mounir Abdel Majeed



Chairman of the scientific committee

Prof. Dr. Moafak mahmood ahmed



Head of the department of Food science

Prof. Dr. Sumaya khalaf badawi

