

TISHK INTERNATIONAL UNIVERSITY
FACULTY OF APPLIED SCIENCE
Department of MEDICAL ANALYSIS,
-2022 Spring
Course Information for MA 308 BIOTECHNOLOGY

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|---|------------------------------|-------------------------|-----------------------|---------------------|------------------|
| Course Name: BIOTECHNOLOGY | | | | | |
| Code MA 308 | Regular Semester 6 | Theoretical 2 | Practical 2 | Credits 3 | ECTS 5 |
| Name of Lecturer(s)- Academic Title: Ahang Mawlood - PhD Ahang Mawlood - PhD | | | | | |
| Teaching Assistant: Adam | | | | | |
| Course Language: - | | | | | |
| Course Type: Main | | | | | |
| Office Hours 3-5 | | | | | |
| Contact Email: ahang.mawlood@tiu.edu.iq ahang.mawlood@tiu.edu.iq Tel:07501710033 07501710033 | | | | | |
| Teacher's academic profile: PhD in medical microbiology. PhD in medical microbiology. | | | | | |
| Course Objectives: At the end of this course, students should be able to develop a good knowledge and a clear understanding of the facts and essentials relating to biotechnology which is covered in lecture and laboratory, these include; 1. The main objective is to offer a broad view of biotechnology, integrating historical, global current and future applications 2. Effective and efficient manipulation of biotechnological resources (instruments, materials and living organisms), following biosafety regulations to avoid hazards 3. Knowledge about bioprocesses and biotechnological in accordance to current normativity and legislation, including biosecurity. 4. Health problems that can be solved by biotechnological processes | | | | | |
| Course Description (Course overview): Biotechnology, often abbreviated to biotech, is the area of biology that uses living processes, organisms or systems to manufacture products or technology intended to improve the quality of human life. Biotechnology a course designed to give students a comprehensive introduction to the scientific concepts and laboratory research techniques currently used in the field of biotechnology. Students attain knowledge about the field of biotechnology and deeper understanding of the biological concepts used. | | | | | |

COURSE CONTENT

| Week | Hour | Date | Topic |
|------|------|---------------|---|
| 1 | 2 | 6-10/2/2022 | Introduction to biotechnology, type of biotechnology |
| 2 | 2 | 13-17/2/2022 | Fermentation and type of batch culture |
| 3 | 2 | 20-24/2/2022 | Fermentation and fermented products |
| 4 | 2 | 27/2-3/3/2022 | Cell culture |
| 5 | 2 | 6-10/3/2022 | Basics of Cell Culturing and Associated Measurements |
| 6 | 2 | 27-31/3/2022 | Antibiotic and vaccine production |
| 7 | 2 | 3-7/4/2022 | Cell and enzyme immobilization |
| 8 | 2 | 10-14/4/2022 | Midterm Exam |
| 9 | 2 | 17-21/4/2022 | Animal models and biomedical research |
| 10 | 2 | 24-28/4/2022 | Animal biotechnology (Hybridomatechnology(production of monoclonal antibody) |
| 11 | 2 | 8-12/5/2022 | Environmental biotechnology(biofertilizer, biodiesel and bioplastic) |
| 12 | 2 | 15-19/5/2022 | Bioremediation and Biosorption |

| | | | |
|----|---|---------------|---|
| 13 | 2 | 22-26/5/2022 | Tools require in biotechnology (starch, paper, gel(SDS-PAGE and agaros), pulsed field, 2 D- Electrophoresis) |
| 14 | 2 | 29/5-2/6/2022 | Tools require in biotechnology (thin layer, ion exchange, affinity, gas and HPLC-Chromatography) |
| 15 | 2 | 5-9/6/2022 | Final Exam |
| 16 | 2 | 12-16/6/2022 | Final Exam |

COURSE/STUDENT LEARNING OUTCOMES

- 1 1-Meaning of Biotechnology and type of Biotechnology with the purpose of studding Biotechnology.
- 2 2-Gene and genetic engineering
- 3 3-Tools used in biotechnology for producing useful products
- 4 4- Natural and artificial gene exchange
- 5 5- Immobilization -meaning and beneficial effects to our life

COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES

(Blank : no contribution, I: Introduction, P: Profecient, A: Advanced)

Program Learning Outcomes

Cont.

| | | |
|----|--|---|
| 1 | Evaluate clinical laboratory data by interpreting laboratory results and relating the data to various disease states. | I |
| 2 | apply principles of evidence-based medicine to determine clinical diagnoses. | P |
| 3 | apply the basic principles of gross and microscopic anatomy, physiology, biochemistry, immunology, microbiology/virology. | A |
| 4 | formulate and implement acceptable treatment modalities to various disease states. | A |
| 5 | use technology effectively in the delivery of instruction, assessment, and professional development. | P |
| 6 | exhibit essential employability qualities by demonstrating laboratory safety, analyzing laboratory results, and displaying professional conduct. | P |
| 7 | exhibit organizational skills, accountability, and ethical behavior. | A |
| 8 | apply skills needed in operating laboratory equipment for testing, assessing quality assurance for lab equipment, and adhering to standard safety practices in the laboratory environment. | A |
| 9 | apply problem-solving and decision-making skills. | A |
| 10 | apply and promote health policies and regulatory standards in the field career. | P |
| 11 | develop research in the field of medical analysis using qualitative and quantitative methods. | A |

Prerequisites (Course Reading List and References):

Microbiology (Principle and Exploration), Microbiology Experiments (fourth edition) , Microbiology (A human perspective), Applied molecular biotechnology.

Student's obligation (Special Requirements):

Classroom polices: 1- Attendance: You are strongly encouraged to attend class on a regular basis, as participation is important to your understanding of the material. This is your opportunity to ask questions. Students are responsible for obtaining any information they miss due to absence. 2- Lateness: Lateness to class is disruptive 3- Electronic devices: All cell phones are to be turned off at the beginning of class and put away during the entire class. 4-Talking: During class please refrain from side conversations. These can be disruptive to other students and the professor, and not Disrespectful to both the professor and to other

Course Book/Textbook:

1. Muhammad Sarwar Khan iqrar Ahmad Khan debmalya Barh Applied Molecular Biotechnology The Next Generation of Genetic Engineering. 2018. 2. Michael Wink. Molecular Biotechnology Fundamentals, Methods and Applications book. 2011. 2. GODBEY, W. T. 2014. An Introduction to Biotechnology: The Science, Technology and Medical Applications, Elsevier. 3. KASTIES, N., JANDCIU, E., JONES, A., WINK, M. & FITZROY, R. 2006. An introduction to molecular biotechnology, John Wiley & Sons. 4. KHAN, F. A. 2018. Biotechnology fundamentals, CRC Press. .

Other Course Materials/References:

1. RENNEBERG, R., BERKLING, V. & LOROCH, V. 2016. Biotechnology for beginners, Academic Press. 2. ROY, J. 2011. An introduction to pharmaceutical sciences: production, chemistry, techniques and technology, Elsevier.

Teaching Methods (Forms of Teaching):

Lectures, Presentation, Assignments, , ,

COURSE EVALUATION CRITERIA

| Method | Quantity | Percentage (%) |
|------------|----------|----------------|
| Attendance | 1 | 5 |

| | | |
|----------------|---|-----------|
| Participation | 1 | 5 |
| Quiz | 1 | 5 |
| Homework | 1 | 5 |
| Midterm Exam | 1 | 15 |
| Laboratory | 1 | 5 |
| Practical Exam | 1 | 15 |
| Final Exam | 1 | 40 |
| Total | | 95 |

Examinations: Essay Questions, True-False, Multiple Choices, Short Answers, Matching, , ,

Extra Notes:

ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD

| Activities | Quantity | Workload Hours for 1 quantity* | Total Workload |
|--|----------|--------------------------------------|----------------|
| Theoretical Hours | 16 | 2 | 32 |
| Practical Hours | 16 | 2 | 16 |
| Final Exam | 1 | 3 | 3 |
| Attendance | 1 | 2 | 2 |
| Participation | 1 | 1 | 1 |
| Quiz | 1 | 2 | 2 |
| Homework | 1 | 1 | 1 |
| Midterm Exam | 1 | 1 | 1 |
| Laboratory | 1 | 3 | 3 |
| Practical Exam | 1 | | 0 |
| Total Workload | | | 61 |
| ECTS Credit (Total workload/25) | | | 2.44 |

Peer review

Signature:
Name:
Lecturer

Signature:
Name:
Head of Department

Signature:
Name:
Dean