College/ Institute	**Technical Health and Medical College - Polytechnic University**	
Department	**MLT**	
Module Name		
Module Code	**LIN205**	
Degree	**Bachler**	
Semester	**2**	
Qualification	**PhD**	
Scientific Title	**lecturer**	
ECTS (Credits)	**6**	
Module type	**Core**	
Weekly hours	**1**	**3**
Weekly hours (Theory)	**(1)hr Class**	**(1)Total hrs Workload**
Weekly hours (Practical)	**(3)hr Class**	**(13)Total hrs Workload**
Number of Weeks	**12**	
Lecturer (Theory)	**Shler qasim Hussein**	
E-Mail & Mobile NO.	**Shler.hussien@epu.edu.iq**	
Lecturer (Practical)	**Lecturer :Sozan Sami Ali**	
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Websites		

Module (Course Syllabus) Catalogue

2022-2023

Course Description	Student introduce to different lab instruments and learn how to use each device and maintain it. Because, during their 4-year study and after their graduations continuously they deal with these devices, therefore it's important to teach students what's these devices and composed of what, and how to maintain it.
Course objectives	**<u>To learn</u>** **1-How to deal with different kind of lab instruments.** **2- How to maintain it.**
Student's obligation	We have theory 1 hours, practical 3 hours General advice: The students obligate to attend the lessons and accomplish all the requirements prepared by the facilitators in both theoretical and practical parts.
Required Learning Materials	different kind of lab instruments

Evaluation

Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Paper Review				
Assignments	Homework	2	2	
	Class Activity	1	1	
	Report	6	6	
	Seminar	1	1	
	Essay			
	Project			
Quiz		6	6	
Lab.				
Midterm Exam				
Final Exam				
Total				

Specific learning outcome:	1- Student introduce to different lab instruments 2 learn how to use each device and maintain 3-Learn use different device for the same test and how to choose the best

Course References:	**1- Benson: Microbiological Applications Lab Manual, Eighth Edition** **2-Essential equipment in medical laboratory (**Ahmad Mustafa bushier)

Course topics (Theory)	Week	Learning Outcome
Lab Equipment	1	The student should introduce to all equipment in the lab including the equipment use in all type of lab .
, Microscope Parts of the Microscope and Their Function	2	Describe and identify each part
Types of light Microscopes	3	Learning the purpose of using different type of light Microscope, advantage and disadvantage of using each type of light Microscope
Centrifugation, Types of centrifuge	4	Principles of centrifugation, define and explain each type of lab centrifuge, how to choose centrifuge according to the sample
Balance, types of Balance	5	purpose of using many types of balance ,and why using Balance.
Incubator, types of incubator	6	Introduce to different type of Incubator , define and explain each type of incubator,
Water bath,Typs of Water bath	7	Describe principle of device,
oven, and autoclave	8	define and explain in details each device oven and autoclave and their usage
pH meter	9	Usage of ph. meter ,why we use it ,
Spectrophotometer	10	Characterization by waves, measurement of wave length of substances
Hb. Meter, CBC	11	Principles of the device , how the device work, analyse the result
Gel electrophoresis	12	Analysis of DNA

Practical Topics	Week	Learning Outcome
Microscope Parts of the Microscope and Their Function	1	Describe and identify each part

Types of light Microscopes	2	using each type of light Microscope
Electron Microscope, Types of Electron Microscopes, difference between light and electron Microscope	3	Student Introduce to Electron Microscope through you tube, because there is no Electron Microscope in our college. If it possible making a scientific trip to
Centrifugation, Types of centrifuge	4	Principles of centrifugation, define and explain each type of lab centrifuge, how to choose centrifuge according to the sample
Balance, types of Balance	5	Learning practically how to use each types of balance ,and the purpose of using each of them .
Incubator, types of incubator	6	Learning practically how to use different type of Incubator , and how to monitor the device according to the environment condition of experiments,
Water bath,Typs of Water bath	7	Learning practically how to use it and how to control temperature and how to clean to maintain a typical environment.
oven, and autoclave	8	Learning practically how to use these device and how to maintain and monitor them .
pH meter	9	Learning practically how to use PH meter, how to do calibration's and how to measure ph of the solutions
Spectrophotometer	10	Practically Characterization by waves, measurement of wave length of substances
Hb. Meter, CBC	11	Principles of the device , how the device work, analyse the result
Gel electrophoresis	12	How to prepper gel for DNA how to analyse the result ,how to measure DNA

Questions Example Design

1. explainational

Q/ why we use fluorescence microscopes?

A1-To study stained organism

2- To study some material which is emit energy when stimulated.

- **True or false type of exams:**

Q/ optical dark field microscope uses to study stained microorganism's

- **F/Study living unstained microorganism's**
- **Single choice Questions**

Q/ to Identify certain crystalline we use:

a-fluorescence-bright field, c-dark field- phase contrast microscope.

A-

Extra notes: **Student should be care about the distance between them, by making sub groups also wearing gloves and mask especially practical experiments.**
External Evaluator

- **Assessment scheme**

40% Assignments
4% Quiz
%25 Midterm Exam
20% Final Theoretical Exam
20% Final Practical Exam

Course Book