



**Cihan University of Sulaymaniyah**  
**Practical Biochemistry**  
**Introduction to the Biochemistry lab**  
**(rules for laboratory experiments,**  
**laboratory safety signs/labels)**

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# What is Biochemistry?!

- Biochemistry is the study of chemical processes that occur within living organisms.
- Biochemistry is all about understanding the chemical reactions happening in living things. It helps us learn how our bodies function and how different molecules interact to keep us alive and healthy.



## *Important Notes !*

- Please make sure to arrive on time for lab sessions. It's important to be punctual and not be late.
- When you come to the lab, please remember to close your lab coat. It's an important safety measure.
- While we're in class, let's keep our phones tucked away and stay fully present.



# Safety Rules:

safety rules for a biochemistry lab:

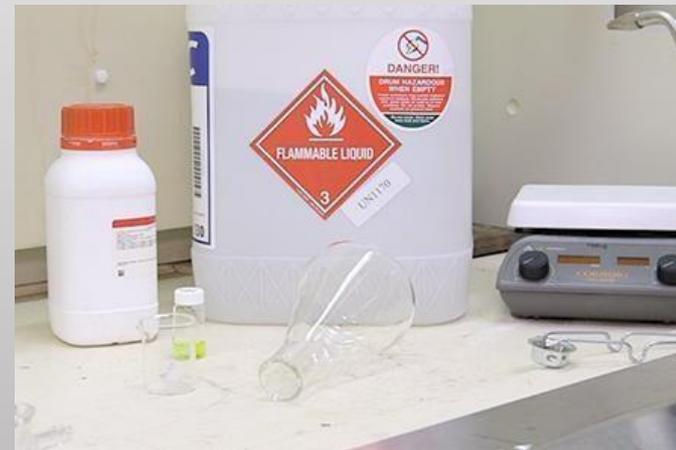
**Safety is paramount in the lab!**

- Wear appropriate personal protective equipment (PPE) like lab coats, gloves, and goggles.
- Follow proper handling and disposal procedures for chemicals and biohazardous materials.
- Keep your work area clean and organized to prevent accidents.
- Never eat, drink, or apply cosmetics in the lab to avoid contamination.
- Be aware of emergency exits, fire extinguishers, and safety showers in case of emergencies.



## ***Safety Rules:***

- Always work under the supervision of a qualified instructor or lab technician.
- Double-check the labels on chemicals and reagents before using them to ensure accuracy
- Report any accidents, spills, or injuries to your instructor immediately.
- Handle glassware and sharp objects with care to prevent cuts and injuries.
- Follow proper procedures for heating, mixing, and transferring chemicals to avoid spills or reactions.



## Hazards in the Lab -Important Terms

- **Severe Toxicity**- adverse effects of a substance that result either from a single exposure or from multiple exposures in a short space of time (usually less than 24 hours)
- **Irritant**- causes redness, inflammation
- **Corrosive**- “eats away” tissue gradually
- **Carcinogenic**- causes cancer
- **Flammable**- easily set on fire
- **Bio hazard**- substances that pose a threat to the health of living organisms, primarily that of humans.



## Lab Assessment Tools

<b>Practical Session</b>			
<b>No.</b>	<b>Activities</b>	<b>Number or Quantity</b>	<b>Mark %</b>
1	Quiz	4-8	4
2	Lab. Report	8-10	8
3	Lab. Presentation	4-8	4
4	Lab. Attitude	-	2
5	Attendance	-	2
<b>Total</b>			<b>20</b>
<b>Final Exam</b>			
1	<b>Practical Examination</b>	1	20
<b>Total</b>			<b>40</b>

## Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	Introduction to laboratory safety procedures, proper use of equipment, safety gear, and emergency protocols. Emphasis on maintaining a safe and organized lab environment.
Week 2	Exploring the principles of spectrophotometry and the interaction between light and matter. Understanding the significance of absorption spectra in analytical chemistry.
Week 3	Practical session to determine the maximum absorbance wavelength ( $\lambda_{max}$ ) for specific compounds using a spectrophotometer. Analyzing absorption spectra for various analytes.
Week 4	Enzymatic methods to quantify glucose levels in serum. Clinical significance in diagnosing diabetes and metabolic disorders, as well as understanding glucose metabolism.
Week 5	Colorimetric methods to measure serum urea concentration, interpreting results in the context of kidney function, hydration status, and renal disorders.
Week 6	Quantification of creatinine in serum using specific assays. Clinical importance in evaluating renal function and diagnosing kidney diseases such as nephritis and renal failure.
Week 7	Laboratory procedure to measure triglyceride concentration in serum. Discussing the role of triglycerides in metabolic disorders and cardiovascular risk assessment.
Week 8	Quantifying total cholesterol levels in serum using colorimetric methods. Analyzing the implications of cholesterol levels in heart disease and overall health.
Week 9	Techniques for quantifying total and direct bilirubin levels in serum. Clinical significance in diagnosing jaundice, liver diseases, and biliary obstruction.
Week 10	Measuring Aspartate Aminotransferase (AST) and Alanine Aminotransferase (ALT) enzyme levels in serum. Relevance to liver health and detecting liver damage or disease.
Week 11	Measurement of Alkaline Phosphatase (ALP) and Lactate Dehydrogenase (LDH) in serum. Understanding their roles in liver function and their use in diagnosing liver, bone, and muscle diseases.
Week 12	Quantification of serum amylase levels. Application in diagnosing pancreatic disorders, including pancreatitis, and its role in digestive enzyme analysis.
Week 13	<b>Review</b>
Week 14	<b>Final Exam</b>

**Thank You**  
**Any Questions?**