



Module (Course Syllabus) Catalogue 2022-2023

College/ Institute	Shaqalawa technical college	
Department	Medical laboratory technology	
Module Name	Clinical chemistry	
Module Code	CLH401	
Degree	Technical Diploma <input checked="" type="checkbox"/>	Bachler <input type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/> PhD <input type="checkbox"/>
Semester	Fourth	
Qualification	Doctorate Degree	
Scientific Title	Lecturer	
ECTS (Credits)	5	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours		
Weekly hours (Theory)	(2)hr Class	(125)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	()Total hrs Workload
Number of Weeks	14	
Lecturer (Theory)	Razhan Salah Othman	
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Lecturer (Practical)	Mr. Omar & Mr. Ramazan	
E-Mail & Mobile NO.		
Websites	Razhan Othman: Public profile (epu.edu.iq)	

Course Book

<p>Course Description</p>	<p>Clinical chemistry: (also known as clinical biochemistry or chemical pathology) is the study of chemical and biochemical mechanisms of the body in relation to disease, mostly through the analysis of body fluids such as blood or urine. Clinical chemists use a wide range of analytical techniques for example, molecular diagnostics, measurement of enzyme activities, spectrophotometry, electrophoresis, the separation of molecules based on physical characteristics and immunoassays The work involves manual techniques for which the biomedical scientist develops complex practical and interpretive skills.</p>			
<p>Course objectives</p>	<p>The goal of the course : a) Provide appropriate and effective consultation (b) Render decisions based on data (c) Render diagnostic interpretational considering clinical implications (d) Provide advice about diagnostic interpretations (e) Explain diagnostic tests or procedures (f) Provide advice about influence of preanalytic variables (g) Provide information about disease-screening methods (h) Use information systems to improve clinical interpretations and transmit information</p>			
<p>Student's obligation</p>	<p>Attendance in the all lectures. • Several quizzes and assignment. • Attendance at midterm and final Exams in end of the course. Attendance on electronic application (zoom , module)</p>			
<p>Required Learning Materials</p>	<p>. Lecture halls Using data show, white board and PowerPoint, computer ,zoom and module application laboratory. • data show , clinical tests kit ,chemical instruments ,safety materials</p>			
<p>Evaluation</p>	<p>Task</p>	<p>Weight (Marks)</p>	<p>Due Week</p>	<p>Relevant Learning Outcome</p>
	<p>Paper Review</p>			
	<p>Assignment</p>	<p>Homework</p>	<p>5%</p>	
		<p>Class Activity</p>	<p>2%</p>	
		<p>Report</p>	<p>3.3%</p>	
		<p>Seminar</p>	<p>3.3%</p>	

	Essay	0		
	Project	3.4%		
	Quiz	8%		
	Lab.	10%		
	Midterm Exam	25%		
	Final Exam	40%		
	Total	100%		
Specific learning outcome:	<p>Upon graduation from the program, students will be able to demonstrate:</p> <ol style="list-style-type: none"> 1. competency to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and postanalytical components of laboratory services, including hematology, chemistry, microbiology, urinalysis, body fluids, molecular diagnostics, phlebotomy, and immunohematology 2. proficiency to problem-solve, troubleshoot, and interpret results, and use statistical approaches when evaluating data 3. professional conduct, respecting the feelings and needs of others, protecting the confidence of patient information, and not allowing personal concerns and biases to interfere with the welfare of patients 4. administrative skills consistent with philosophies of quality assurance 5. application of safety and governmental regulations and standards as applied to medical laboratory practice 6. effective communication skill to ensure accurate and appropriate information transfer. 			
Course References:	<p>Key references:</p> <p>clinical chemistry (principles, procedures, correlation) by Michael L.Bishop and Larry Schoef 5th edition 2005.</p> <p>Organic chemistry 6th - edition , by Morrison and Boyd</p> <p>Useful references: practical general chemistry for medical قسم التحليلات المرضية</p>			
Course topics (Theory)	Week	Learning Outcome		
NON Protein nitrogen (protein urea), method of analysis, determination protein of blood .	1			
Creatinine (renal function) .	2			

Uric acid		
Enzymes, general properties, definition, Classification and nomenclature	3 4	
Enzyme of clinical significant, functions, enzymes effective change.	5 6	
Electrolytes , osmolality ,sodium an ion concentration ,regulation ,hypo and hyper nateremia and treatments .		
Potassium and bicarbonate level in serum ,regulation ,hypokalemia and hyperkalemia ,symptoms and treatments.	7	
Liver function , anatomy, physiology, disorder of the liver	8	
Liver functions, analysis of bilirubin , enzyme tests in liver disease.	9	
Gastrointestinal function ,physiology and biochemistry of gastric secretion.	10	
Hormones, function of pancreatic, disease of pancreas	11	
Trace elements , iron, copper , zinc.	12	
Cobalt , chromium, florid, manganese.	13	
Vitamins ,energy requirements, fat soluble, water soluble , metabolism.General urine analysis	14	
Practical Topics	Week	Learning Outcome
NPN :blood urea nitrogen test in the lab for different serum sample	1	
Determination Creatining in the blood ,Cr/BUN ratio	2	
Uric acid determination in the blood	3	
Enzymes: specification of active amylase in blood.	4	
Enzymes: specification of active amylase in urine.	4	
Specification of active ALP in Blood.	5	

Specification of active ALT in blood.	6	
Direct Bilirubin test	7	
Calcium determination in the blood.	8	
Electrolytes of sodium, preparing of serum blood sodium.	9	
Electrolyte of potassium and calcium ,preparing in serum blood sample	10	
Determination of LH and FSH hormone in the blood	11	
Determination of cobalt	12	
Determination of zinc	13	
Scientific picnic to general lab .general urine examination (GUE).	14	

Questions Example Design

Q/What are electrolyte?

SOL: Chemically, electrolytes are substances that become ions in solution and acquire the capacity to conduct electricity.

Q/How can treatment of hypo and hypernatremia ?explain

Sol: Treatment Treatment is directed to At correction of the underlying condition that caused the water depletion or sodium retention .The maximum rate should be 0.5mmol/L per hour.

Multiple Choices:

Q/A 3 year old is admitted with gastroenteritis and dehydration. His serum sodium is 167 mEq/L. Once he is hemodynamically stable, fluid management should be focused on providing:

1-Glucose

Free water-2

3-Sodium

4-Potassium

2- is the correct answer. Hypernatremia is a total body free water deficit rather than an excess of sodium

Extra notes:

External Evaluator

