Course syllabus of Clinical Chemistry 1

Faculty: Medicine and Health Sciences
Department: Health Sciences
Program: Bachelor in Medical Laboratory

I. General information about the course instructor:

Name	Dr. Ali Ali Ahmed Alhaj	Office Hours					
Location & phone number	713465553 / 4114	Sat	Sun	Mon	Tue	Wed	Thu
Email	alhajjj20@yahoo.com	-	1	-	1	-	1

II. General information about the course:

1.	Course Title:	Clinical Chemistry 1				
2.	Course Code and Number :	BML356				
3.	Credit Hours :	Lecture	Seminar/Tutorial	Practical	Training	Total
		2	-	1	-	3
4.	Study Level and Semester:	3rd year /1st semester				
5.	Pre-requisites:	BML235 & BML245				
6.	Co-requisites:	None				
7.	Program in which the course is offered	Bachelor in Medical Laboratory				
8.	Teaching Language:	English				
9.	Instruction location:	University of Science and Technology, Sana'a ,Yemen				

III. Course Description

This course discusses the role of biochemistry in clinical diagnosis; perform biochemical analyses using a variety of instrument and assist in the interpretation of results in routine clinical biochemical testing. This course provides an overview of normal and abnormal metabolic functions. The impact of disorders on metabolic processes is introduced with disease state of specific organs highlighted. Topics covered include disorders in carbohydrates and lipid metabolism, plasma protein and its disorders, liver functions and liver function tests, renal functions and renal function tests, electrolytes, and inborn errors of metabolism. The course is based on lectures as well as seminars, group discussion, lab experiments, Log book, group works, collaborative learning, and self-study. The students will be evaluated through written exam, short essay, problems, practical exam, lab report and evaluation of log book. Biochemistry 1 and Biochemistry 2 courses are the prerequisite courses.

جامعة العلوم والتكنولوجيا
إدارة ضمان الجودة والاعتماد
معتمد

APPROVED

الموصف : أ.د على الحاج
المراجع : د. عبدالحبيب القباطي
د. حمود الحبابي
رئيس القسم: د. عبد الحبيب القباطي
عميد الكلية: د. عبد الله المخلافي

IV. Course Aims: This course is aimed to:

1. Provide an overview of the role of a clinical biochemistry laboratory in assisting diagnosis and monitoring disease states of patients.
2. Make the students able to understand the principles of clinical biochemistry related to health and disease.
3. Enable the students to point-out hereditary and acquired metabolic disturbances and their biochemical laboratory and clinical outcomes.
4. Provide the students sickle to separate plasma proteins by different methods and the importance of their application.
5. Enable the students to perform and interpret routine clinical testing and describe the levels of various analyses, i.e., blood glucose, blood lipids, blood electrolytes, liver and, kidney function tests.

V. Course Intended Learning Outcomes (CILOs):

1. List the metabolic disorders of carbohydrates, lipids, plasma proteins, electrolytes, and uric acids.
2. Determine the relation between biochemistry and medicine through knowing the human chemistry levels in (renal, liver function tests, and electrolytes)
3. Interpret the clinical significance of determination of plasma levels of glucose, total proteins, SGOT, SGPT, bilirubin, albumin, cholesterol, TG, creatinine and uric acid
4. Discuss symptoms, signs and biochemical laboratory findings of some metabolic disorders.
5. Carry out laboratory investigations by applying appropriate methodology and techniques, demonstrate ability in using equipment available in the laboratories
6. Estimate serum levels of glucose, total proteins, albumin, cholesterol, creatinine and uric acid by colorimetric methods, and assess glucose tolerance by glucose tolerance test.
7. Work effectively in a group in a lab or during preparation of seminars and respects the role of staff and co-staff members regardless of degree or occupation.

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VI. Course Contents:

Theoretical Aspect:

No.	Course Units	Sub-topics	Week due	Contact Hours
1	**Introduction to clinical chemistry**	- Introduction to general fundamentals and principles of clinical bio-analytical chemistry - Quality control, diagnostic efficiency	1st	2
2	**Disorders in carbohydrates metabolism**	- Hormone control blood glucose - Hyper and hypoglycemia (definition and causes) - Diabetes mellitus definition, types, symptoms, diagnoses (blood glucose measurements, fasting, post-prandial , random blood glucose, oral glucose tolerance, glycosylated hemoglobin (HbA1C)	2nd – 4th	6
3	**Disorders in lipid metabolism**	- Cholesterol, triglyceride , and lipoproteins abnormalities: - Hyper and hyperlipidemia - Hypercholesterolemia - Hypertriglyceridemia - Mixed hyperlipidemia	5th , 6th	4
4	**Plasma protein and its disorders**	- Functions of plasma protein - Classification of plasma protein - Hyper- and hypoalbuminemia - Hyper and hypoproteinemia - Function of different plasma protein - prealbumin ,albumin ,α1,α2 ,β1 β2 and globulins	7th	2
5	**Med-term exam**		8th	2
6	**Clinical Enzymology**	- Introduction about enzymes - Uses of enzymes in clinical diagnosis	9th	2
7	**Liver functions and liver function tests**	- Function of liver (synthetic, metabolic, detoxification and Excretion) - Liver diseases: - Pre hepatic, hemolytic jaundice ,gilbert , Crjglar najjar syndrome - Hepatic :Acute ,chronic ,cirrhosis, hepatoma - Post hepatic: Obstructive jaundice,(intra and extra cholestasis)	10th , 11th	4
8	**Renal functions and renal function tests**	- Serum osmolality, osmolar gap and anion gap. - Glomerular function - Tubular function - Renal diseases, pre renal, renal post renal, acute renal failure - Chronic renal failure , renal function test , urea, uric acid , creatinine, creatinine clearance, cystatin C	12th , 13th	4
9	**Electrolytes**	- Electrolyte disorders: - Hypo and hypernatremia, hypo and hyperkalemia, hypo and hyperchloremia , trace elements, zinc and selenium	14th	2
10	**Inborn errors of metabolism**	- PKU, Lactose intolerance, galactosemia, albinism, and gout.	15th	2
11	**Final term exam**		16th	2
	Total number of weeks and hours		**14**	**32**

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Second: Practical/Tutorial/Clinical Aspects :			
No.	**Practical/Tutorial/Clinical topics**	**Week due**	**Contact Hours**
1.	- Glucose estimation FBG ,RBG ,PPT ,OGTT, HbA1C abnormalities and measurements	2^{nd} , 3^{rd}	4
2.	Lipid profile: triglyceride, total cholesterol, HDL cholesterol and LDL cholesterol abnormalities and measurements	4^{th} , 5^{th}	4
3.	- Total protein and albumin abnormalities and measurements - Serum protein electrophoresis abnormalities and measurements	6^{th} , 7^{th}	4
4.	- Liver function tests: Bilirubin (direct and total), GPT,GOT, ALP , GGT, PT and albumin abnormalities and measurements	8^{th} – 10^{th}	6
5.	Kidney function tests: urea, creatinine, creatinine clearance and cystatin C abnormalities and measurements	11^{th} , 12^{th}	4
6.	Na, K, CL abnormalities and measurements	13^{th}	2
7.	Uric acid abnormalities and measurements	14^{th}	2
8.	Practical Final exam	15^{th}	2
Total number of weeks and hours		**14**	**28**

المراجع :
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