

وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي

استمارة وصف البرنامج الأكاديمي للكليات والمعاهد

الجامعة : ديالى

الكلية/المعهد : الطب

القسم العلمي : فرع الكيمياء الحياتية

تاريخ ملء الملف : 15 . 6 . 2021

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التاريخ : 2023 / 9 / 1

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دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي :

التاريخ :

التوقيع :

مصادقة السيد العميد

نموذج الوصف الأكاديمي لفرع الكيمياء الحياتية



يوفر وصف البرنامج الأكاديمي هذا ايجازاً مقتضياً لأهم خصائص البرنامج ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأً عما إذا كان قد حقق الاستفادة القصوى من الفرص المتاحة . ويصاحبه وصف لكل مقرر ضمن البرنامج .

1 - المؤسسة التعليمية
كلية الطب
2- القسم العلمي / المركز
فرع الكيمياء الحياتية
3- اسم البرنامج الأكاديمي أو المهني
الطب البشري
4- اسم الشهادة النهائية
بكالوريوس طب وجراحة عامة
5- اشكال الحضور المتاحة
حضور الزامي فعلي
6- النظام الدراسي (سنوي / مقررات / كورسات)
كورسات
7- الفصل / السنة
كورس أول + كورس ثاني 2023
8- عدد الساعات الدراسية
المرحلة الأولى / 150 ساعة (90 ساعة (نظري) ، 60 ساعة (عملي)) المرحلة الثانية / 150 ساعة (90 ساعة (نظري) ، 60 ساعة (عملي))
9- برنامج الاعتماد المعتمد
الدراسة النظرية والعملية والمناقشات في الكلية و في المستشفيات التعليمية
10- المؤثرات الخارجية الأخرى
المستشفى التعليمي ، المكتبة ، الأنترنت ، المجتمع ، نقابة الأطباء
11- تاريخ إعداد الوصف

12- اهداف البرنامج التعليمي

- 1- اعداد طلبة كفؤين علمياً وعملياً في مجال تحليلات الكيمياء الحياتية السريرية .
- 2- فهم الأسس للمتغير البايوكيميائية التي تحدث في حالة الإصابة بالمرض .
- 3- اتباع الطرق الحديثة في التحليلات المرضية للحصول على نتائج دقيقة .

13- مخرجات البرنامج المطلوبة وطرائق التعليم والتعلم والتقييم**➤ الأهداف المعرفية**

- 1- اعداد طلبة ذو كفاءة عالية في الأسس النظرية والعملية لمادة الكيمياء الحياتية وطرق اجراء التحاليل المرضية بتقنيات حديثة .
- 2- بيان خطوات حدوث الأيض الحيوي للكربوهيدرات واللبدات والبروتينات داخل جسم الإنسان وتعليم الطلبة كيفية اجراء تحاليل الكيمياء السريرية والأورام السرطانية .

➤ الأهداف المهاراتية الخاصة بالبرنامج

دراسة ايض الكربوهيدرات واللبدات والبروتينات والأحماض النووية بالإضافة الى الهرمونات والفيتامينات وكذلك وظائف اعضاء الجسم المختلفة والتغيرات البايوكيميائية التي تحصل في الخلايا السرطانية .

• طرائق التعليم والتعلم

- 1- تزويد الطلبة بالأساسيات النظرية لمعرفة المتغيرات البايوكيميائية في حالة الإصابة بالمرض .
- 2- زيارة مختبرات الكيمياء السريرية في المستشفيات التعليمية .

• طرائق التقييم

- 1- الأمتحانات اليومية
- 2- قدرة الطالب العلمية والعملية على حل المشاكل الصحية
- 3- امتحانات نصف الكورس و امتحان نهاية الكورس

➤ الأهداف الوجدانية والتقييمية

- 1- تهيئة الطالب علمياً لمعرفة العلاقة بين الأمراض والمسببات .

2- خلق بيئة مناسبة للطلبة للحفاظ على صحة الإنسان .

• طرائق التعليم والتعلم

1- اعطاء المحاضرات النظرية .

2- المختبرات العملية الخاصة .

• طرائق التقييم

1- امتحان نصف الكورس .

2- امتحانات قصيرة فجائية .

3- درجات المختبر العملي .

4- امتحان نهاية الكورس .

14- المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي)

1- اعداد طلبة كفؤين علمياً لحل المشاكل الصحية .

2- مشاركة الطلبة في الدورات التدريبية خلال العطلة الصيفية وإعداد برنامج بذلك .

بنية البرنامج

الساعات المعتمدة		اسم المادة	رمز المادة	المرحلة الدراسية
عملي	نظري			
2 ساعة أسبوعياً الكورس (15 اسبوع) عدد الساعات الكلي لكل كورس (45 ساعة)	3 ساعة أسبوعياً الكورس (15 اسبوع) عدد الساعات الكلي لكل كورس (45 ساعة)	الكيمياء الطبية والحياتية	HR115	الأولى
2 ساعة أسبوعياً الكورس (15 اسبوع) عدد الساعات الكلي لكل كورس (45 ساعة)	3 ساعة أسبوعياً الكورس (15 اسبوع) عدد الساعات الكلي لكل كورس (45 ساعة)	الكيمياء الحياتية والأبيض	BIOC201 BIOC202	الثانية

مخطط مهارات المنهج

مخطط مهارات المنهج																اسم المقرر	رمز المقرر	السنة / المستوى
المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي)				الأهداف الوجدانية والقيمية				الأهداف المهاراتية الخاصة بالبرنامج				الأهداف المعرفية						
د4	د3	د2	د1	ج4	ج3	ج2	ج1	ب4	ب3	ب2	ب1	أ4	أ3	أ2	أ1			
				-	-			-	-			-				الكيمياء الطبية والحياتية	HR115	الأولى
																طب الاطفال	BIOC201 BIOC202	الثاني

15- بنية المقرر للكيمياء الطبية النظري / المستوى الدراسي الأول / الكورس الأول

طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Fluid and Electrolyte Balance	1. Define body fluid and electrolytes. 2. Know the volumes and	3 ساعة	1

			<p>main composition of body fluids.</p> <p>3. List the factors that determine body water content and describe the effect of each factor.</p>		
امتحان	محاضرة	Fluid and Electrolyte Balance	<p>1. Describe the role of the body systems in regulating the body's fluid composition and volume.</p> <p>2. Describe mechanisms that regulate water intake and hormonal controls of water output in urine.</p>	3 ساعة	2
امتحان	محاضرة	Acid-Base Balance	<p>1. Defines acids, bases.</p> <p>2. Know the natural acids and bases ratio of the body.</p> <p>3. Recognize the types of acid and base.</p> <p>4. List the source of acids and bases of the body.</p>	3 ساعة	3
امتحان	محاضرة	Acid-Base Balance	<p>1. Study the systems responsible for maintenance of the acid-base balance.</p> <p>2. Explain the role of buffer systems in regulating the pH of the intracellular fluid and the extracellular fluid.</p> <p>3. Discuss acid base disorders</p> <p>4. Analysis of Acid-Base Imbalances Report</p>	3 ساعة	4
امتحان	محاضرة	Chemistry of Carbohydrates-1 Monosaccharides & Disaccharides	<p>1. Define carbohydrate and the groups of saccharides</p> <p>2. Know the chemical structure of the common sugars.</p> <p>3. Understand the concepts of and isomerism in simple sugars anomers.</p>	3 ساعة	5

امتحان	محاضرة	Chemistry of Carbohydrates-1 Monosaccharides & Disaccharides	<ol style="list-style-type: none"> 1. Glycosides, sugar alcohols, sugar acids, phosphate esters, deoxy sugars and amino sugars. 2. Understand the role saccharides play in biology 3. Know the biochemical functions and differences between the various heteropolysaccharides 	3 ساعة	6
امتحان	محاضرة	Chemistry of Carbohydrates-1 Monosaccharides & Disaccharides	<ol style="list-style-type: none"> 1. Be able to recognize the N and O linked polysaccharides 2. Know how dietary polysaccharides are digested by humans 	3 ساعة	7
امتحان	محاضرة	Chemistry of Carbohydrates- Polysaccharides Part-2	<ol style="list-style-type: none"> 1. Study the chemical structure of polysaccharides 2. Classify polysaccharides 	3 ساعة	8
امتحان	محاضرة	Chemistry of Carbohydrates- Polysaccharides Part-2	<ol style="list-style-type: none"> 1. Know the biochemical functions and differences between the various heteropolysaccharides 2. Be able to recognize the N and O linked polysaccharides 	3 ساعة	9
امتحان	محاضرة	Chemistry of Carbohydrates- Polysaccharides Part-2	- Know how dietary polysaccharides are digested by humans	3 ساعة	10
امتحان	محاضرة	Fatty acids & Derivatives	<ol style="list-style-type: none"> 1. Have general idea about lipid structure and properties 2. Classify lipids 3. List the major physiological functions of fatty acids 4. Derive the structure of saturated or unsaturated 	3 ساعة	11

			fatty acids.		
امتحان	محاضرة	Fatty acids & Derivatives	<ol style="list-style-type: none"> 1. Study the relation between the structure and function of fatty acids 2. Be able to specify the omega or delta ends. Recognize the alpha, beta and gamma carbons of fatty acids 3. List and be able to identify the general features of the eicosanoids. 4. Know the biochemical functions of the eicosanoids 	3 ساعة	12
امتحان	محاضرة	Glyceride , Non-glyceride & Complex lipids	<ol style="list-style-type: none"> 1. Classify lipids. 2. Know the mean class of lipids 3. Have an idea about the structure of each class. 	3 ساعة	13
امتحان	محاضرة	Glyceride , Non-glyceride & Complex lipids	<ol style="list-style-type: none"> 1. Understand the physical and chemical of the classes. 2. List the biological function of all classes. 3. Relate the structure and properties with the diseases come as a result of this lipids 	3 ساعة	14
امتحان	محاضرة	Final first		3 ساعة	15
16- بنية المقرر للكيمياء الطبية العملى / المستوى الدراسى الأول / الكورس الأول					
طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Laboratory safety	<ol style="list-style-type: none"> a. Understand the proper laboratory safety. b. Increase the awareness of the possible risks or hazards involved with laboratory work. c. Realize the laboratory is generally a safe place to work if safety 	2 ساعة	1

			guidelines are properly followed.		
امتحان	محاضرة	Laboratory instruments and apparatuses	<ul style="list-style-type: none"> a. Identify and categorize the different instruments and apparatuses with their parts and uses in practice . b. Identify the photometer with its main parts and uses 	2 ساعة	2
امتحان	محاضرة	Units and references values	<ul style="list-style-type: none"> a. Recognize the principles of photometry and the related laws. b. Measure weight and volume 	2 ساعة	3
امتحان	محاضرة	Applications of spectrophotometers	<ul style="list-style-type: none"> a. Learn the purpose and proper use of a spectrophotometer. b. Determine the relationship between light absorbance and the number of particles in a sample in a given volume. c. Apply different methods for expressing concentration . d. Prepare stock solutions and perform different dilutions 	2 ساعة	4
امتحان	محاضرة	Blood components	<ul style="list-style-type: none"> a. Describe the blood components in details. b. Explain the blood samples in details. 	2 ساعة	5
امتحان	محاضرة	Preparation of plasma and serum for analysis	<ul style="list-style-type: none"> a. Describe the blood samples in details. b. Outline the importance of blood samples. 	2 ساعة	6
امتحان	محاضرة	Sample collection, processing and handling	<ul style="list-style-type: none"> a. Outline the type of biological samples . b. Describe the Blood collection techniques . 	2 ساعة	7
امتحان	محاضرة	pH and Buffer, Acid-Base Balance	<ul style="list-style-type: none"> a. Explain the acid base balance. b. Describe the role of buffers in maintaining the pH of a solution in body fluids. 	2 ساعة	8
امتحان	محاضرة	Buffers in blood	<ul style="list-style-type: none"> a. Identify the most powerful buffer systems in the body. b. Outline the importance of the buffer systems. 	2 ساعة	9

امتحان	محاضرة	Urinalysis (UA)	a. Outline the importance of urine samples b. Describe the collection of urine samples c. Describe urine examinations	2 ساعة	10
امتحان	محاضرة	Analysis of normal constituents of urine	a. Describe the content of normal urine samples. b. Explain the results of urine examinations.	2 ساعة	11
امتحان	محاضرة	Analysis of abnormal constituents of urine	a. Describe the content of abnormal urine samples. b. Explain the results of urine examinations for different cases.	2 ساعة	12
امتحان	محاضرة	General stool examination	a. Outline the importance of stool samples b. Describe the collection of stool samples c. Describe stool examinations	2 ساعة	13
امتحان	محاضرة	Hematological test	a. Outline the importance of hematological test b. Explain the hematological test	2 ساعة	14
امتحان	محاضرة	First- semester practical examination		2 ساعة	15

17- بنية المقرر للكيمياء الطبية النظري / المستوى الدراسي الأول / الكورس الثاني

طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Amino Acids & Proteins Part 1	1. Describe the general structure of an amino acid. 2. Recognize amino acids and classify them based on the characteristics of their side chains. 3. List the twenty common	3 ساعة	1

			amino acids found in living organisms.		
امتحان	محاضرة	Amino Acids & Proteins Part 1	<ol style="list-style-type: none"> 1. Describe how a peptide bond forms. 2. Understand the biologic activities of peptides 	3 ساعة	2
امتحان	محاضرة	Amino Acids & Proteins Part 2	<ol style="list-style-type: none"> 1. Understand that amino acids are linked via peptide bonds to make polypeptides and proteins 2. Understand that each protein molecule can be hundreds of amino acids long and the amino acids must be joined in a precise order. 3. Know that the side-chains (R groups) of the amino acids can interact with one another to fold the protein into a particular shape which is essential for the protein to function correctly. 	3 ساعة	3
امتحان	محاضرة	Amino Acids & Proteins Part 2	<ol style="list-style-type: none"> 1. Describe, using examples, the relationship between protein structure and function. 2. Define denaturation and list factors led to protein denaturation 3. List some medical application of denaturation 	3 ساعة	4
امتحان	محاضرة	Amino Acids & Proteins Part 3	<ol style="list-style-type: none"> 1. Classify proteins according to different parameters including chemical composition, shape, biological function, solubility in water. 2. Describe, using examples, the relationship between protein structure and function 	3 ساعة	5

امتحان	محاضرة	Amino Acids & Proteins Part 3	-Explain of biological activity of some important proteins	3 ساعة	6
امتحان	محاضرة	Nucleic Acids Part 1	<ol style="list-style-type: none"> 1. Describe the structure of a nucleotide as being a phosphate group, pentose sugar (either ribose or deoxyribose), and a nitrogen containing base, 2. Recall that the nitrogenous bases are adenine, cytosine, guanine, and thymine in DNA, or uracil in RNA, and the base pairings that occur, 3. State that a nucleic acid is formed from many nucleotides, joined by condensation reactions, 	3 ساعة	7
امتحان	محاضرة	Nucleic Acids Part 1	<ol style="list-style-type: none"> 1. Compare and contrast the structures of DNA and RNA, 2. Explain the importance of DNA in storing genetic material and safely transferring genetic information between organisms. 	3 ساعة	8
امتحان	محاضرة	Nucleic Acids Part 2 Protein Biosynthesis	<ol style="list-style-type: none"> 1. Comprehend the universal nature of the gene. 2. Be able to define replication of DNA. 3. Know the roles of mRNA, ribosomes, tRNA and amino acids in the process of translation. 4. Understand what start codons and stop codons 	3 ساعة	9

			<p>are.</p> <ol style="list-style-type: none"> Understand how a polypeptide is built, one amino acid at a time, in the different docking sites of the ribosome. Understand how tRNAs are 'charged' with amino acids. Know that ribosomes consist of a large and a small subunit. Be able to define polysome. 		
امتحان	محاضرة	Nucleic Acids Part 3	<ol style="list-style-type: none"> Define how errors by DNA polymerase create mutations Identify the types of gene mutations. Describe what occurs during each type of mutation. Explain the structure and shape of viruses. Know the viral replication, viral transaction and viral protein biosynthesis. Discuss how to prevent viral transaction and viral protein biosynthesis 	3 ساعة	10
امتحان	محاضرة	Enzymes Part 1	<ol style="list-style-type: none"> Define enzyme and explain basic functions of enzymes Explain basic properties of enzymes Discover and defines the enzyme components Express localization of enzymes in the cell 	3 ساعة	11

امتحان	محاضرة	Enzymes Part 1	<ol style="list-style-type: none"> 1. Defines the active site and catalytic activity of enzyme 2. Discuss working principle of enzymes 3. Express the relationship between enzyme and substrate 	3 ساعة	12
امتحان	محاضرة	Enzymes Part 2	<ol style="list-style-type: none"> 1. Explain what an enzyme inhibitor is. 2. Distinguish between reversible and irreversible inhibitors. 3. Differentiate between competitive and noncompetitive inhibitors. 	3 ساعة	13
امتحان	محاضرة	Enzymes Part 2	<ol style="list-style-type: none"> 1. Discuss the biological role of isoenzymes and their use in clinical diagnosis. 2. Understand the bases of enzyme catalysis and the mechanisms of enzyme regulation. 3. Know the role of regulatory enzymes in controlling metabolic pathways and cellular responses. 	3 ساعة	14
امتحان	محاضرة	Final second semester exam		3 ساعة	15

18- بنية المقرر للكيمياء الطبية العملي / المستوى الدراسي الأول / الكورس الثاني

طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Blood Glucose Test	<ol style="list-style-type: none"> a. Identify the principles of the blood glucose test b. Calculation of glucose concentration in the unknown sample 	2 ساعة	1
امتحان	محاضرة	Oral Glucose	<ol style="list-style-type: none"> a. Explain the types of the 	2 ساعة	2

		Tolerance Test	blood glucose tests b. Define the Oral Glucose Tolerance Test		
امتحان	محاضرة	Diabetes mellitus	a. Describe diabetes mellitus. b. Explain its diagnosis and classification.	2 ساعة	3
امتحان	محاضرة	Case scenario of diabetes mellitus (Type I)	a. Describe Type I diabetes mellitus. b. Illustration of case studies on Type I Diabetes Mellitus.	2 ساعة	4
امتحان	محاضرة	Case scenario of diabetes mellitus (Type II)	a. Describe Type II diabetes mellitus. b. Illustration of case studies on Type II Diabetes Mellitus.	2 ساعة	5
امتحان	محاضرة	Lipid Profile	a. Identify the principles of the lipid profile test b. Calculation of total cholesterol concentration in the unknown sample	2 ساعة	6
امتحان	محاضرة	Lipoproteins	a. Identify the lipoproteins b. Estimate the concentration of HDL and LDL in the unknown sample	2 ساعة	7
امتحان	محاضرة	Plasma lipids and lipoproteins	a. Describe disorders of lipid metabolism b. Illustration of case study	2 ساعة	8
امتحان	محاضرة	Case scenario of hypercholesterolemia	a. Describe hypercholesterolemia. b. Illustration of case studies on hypercholesterolemia.	2 ساعة	9
امتحان	محاضرة	Case scenario of hypercholesterolemia in patients with diabetes mellitus	a. Describe hypercholesterolemia in patients with diabetes mellitus . b. Illustration of case studies on hypercholesterolemia in patients with diabetes mellitus.	2 ساعة	10

امتحان	محاضرة	Triglycerides	a. Identify the principles of the triglycerides test b. Calculation of TG concentration in the unknown sample	2 ساعة	11
امتحان	محاضرة	Case scenario of hyperlipidaemia	a. Describe hyperlipidaemia . b. Illustration of case studies on hyperlipidaemia .	2 ساعة	12
امتحان	محاضرة	Case scenario of hyperlipidaemia in patients with diabetes mellitus	a. Describe hyperlipidaemia in patients with diabetes mellitus . b. Illustration of case studies on hyperlipidaemia in patients with diabetes mellitus.	2 ساعة	13
امتحان	محاضرة	Case scenario of hypercholesterolemia and hyperlipidaemia in patients with diabetes mellitus	a. Describe hypercholesterolemia and hyperlipidaemia in patients with diabetes mellitus . b. Illustration of case studies on hypercholesterolemia and hyperlipidaemia in patients with diabetes mellitus .	2 ساعة	14
امتحان	محاضرة	Second-semester examination		2 ساعة	15

19- بنية المقرر للكيمياء الحياتية النظري / المستوى الدراسي الثاني / الكورس الأول

طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Introduction to Carbohydrate metabolism	1. Identify the major saccharides found in the human body and diet. 2. What is the process of carbohydrate metabolism. 3. Draw diagram of how glucose	3 ساعة	1

			transported across intestinal epithelial cells and into the blood stream and describe the protein involved.		
امتحان	محاضرة	Glycolysis	<ol style="list-style-type: none"> 1. Describe the overall purpose of glycolysis, its cellular reactants and products, its cellular localization and its tissue distribution. 2. Differentiate the roles of hexokinase and glucokinase in blood glucose regulation . 3. Describe the purpose of the reaction catalyzed by LDH. 4. Predict the results of a CBC in a person with PK deficiency who is in hemolytic crisis. 5. Explain the biochemical basis of the hemolytic anemia observed in deficiency of erythrocyte pyruvate kinase . 	3 ساعة	2
امتحان	محاضرة	TCA Cycle	<ol style="list-style-type: none"> 1. Describe the overall purpose of the TCA cycle , its reactants and products ,its cellular localization and its tissue distribution. 2. Explain the effect of the ATP and citrate on the activity of the TCA cycle. 3. Describe the role of the TCA Cycle intermediates as sources of reactants for biosynthetic pathways. 	3 ساعة	3
امتحان	محاضرة	Gluconeogenesis , Glycogen metabolism	<ol style="list-style-type: none"> 1. Differentiate the enzymes involved in glycolysis and gluconeogenesis. 2. Explain the contribution of gluconeogenesis to blood glucose regulation. 3. Evaluate the relative importance of different precursors for gluconeogenesis in feeding, 	3 ساعة	4

			<p>fasting and exercise.</p> <ol style="list-style-type: none"> Describe the overall purpose of gluconeogenesis and glycogenolysis, their reactants and products, their cellular localization and their tissue distribution. Explain how glycogen synthesis and glycogenolysis are regulated by insulin, glucagon and catecholamine's. Select laboratory tests that would contribute to the diagnosis of glycogen storage disease. 		
امتحان	محاضرة	Pentose phosphate pathway	<ol style="list-style-type: none"> Describe the overall purpose of the PPP, its reactants and products and its cellular localization. Describe the role of reduced glutathione in the body. Explain the biochemical basis of the drug induced hemolytic anemia observed in G6PD deficiency. Select laboratory tests used to diagnose G6PD deficiency. 	3 ساعة	5
امتحان	محاضرة	Diabetes Mellitus	<ol style="list-style-type: none"> Compare and contrast type 1 and type 2 diabetes mellitus with respect to incidence, age of onset and distinguishing characteristics. Describe abnormalities in blood glucose homeostasis in patients with type 1 diabetes. Recognize the clinical presentation of type 1 	3 ساعة	6

			<p>diabetes mellitus.</p> <p>4. Discuss how lifestyle factors impact the development of type 2 diabetes.</p>		
امتحان	محاضرة	Ethanol metabolism	<p>1. Identify the metabolic products of ethanol metabolism including acetyl CoA .</p> <p>2. Evaluate the metabolic effects and clinical significance of ethanol and its metabolites.</p> <p>3. Explain the biochemical basis for the effects of alcohol ingestion on gluconeogenesis.</p> <p>4. Generate a problem list with potential biochemical causes of hypoglycemia , hepatomegaly or lactic acidosis.</p>	3 ساعة	7
امتحان	محاضرة	G6PD Deficiency	<p>1. Describe the characteristics feature of hemolytic anemia.</p> <p>2. Identify G6PD genetic variant.</p> <p>3. Recognize the clinical manifestation of G6PD deficiency.</p> <p>4. Describe diagnosis of G6PD deficiency.</p> <p>5. Discuss the treatment of G6PD deficiency.</p>	3 ساعة	8
امتحان	محاضرة	Inborn errors of metabolism	<p>1. Definition of inborn error of metabolism.</p> <p>2. Sample collection procedure.</p> <p>3. Molecular basis of urea cycle disorders.</p> <p>4. Genetic basis of phenylketonuria.</p>	3 ساعة	9
امتحان	محاضرة	Digestion and absorption of protein	<p>1. Identify types of protein.</p> <p>2. Describe digestion of protein by gastric secretion.</p> <p>3. Illustrate the action of rennin.</p> <p>4. Discuss the intestinal secretion of protein.</p>	3 ساعة	10
امتحان	محاضرة	Mineral metabolism	<p>1. Definition of minerals.</p> <p>2. Definition of trace element.</p> <p>3. Illustrate factors that promote calcium absorption.</p> <p>4. Describe function of calcium.</p>	3 ساعة	11

			5. Discuss causes of hypercalcemia.		
امتحان	محاضرة	Lipid metabolism	<ol style="list-style-type: none"> 1. Differentiate the contribution of diet and endogenous synthesis to lipid levels. 2. Describe the pathway of fatty acid synthesis. 3. Describe the synthesis of triglycerides. 4. Distinguish the composition of different sphingolipids. 	3 ساعة	12
امتحان	محاضرة	Fatty acid synthesis	<ol style="list-style-type: none"> 1. Describe the pathway of fatty acid synthesis. 2. Distinguish the effect of the feeding, fasting, exercise and hormonal regulation on body lipid. 3. Describe endocrine function of adipose tissue. 	3 ساعة	13
امتحان	محاضرة	Beta -oxidation ,cholesterol and ketone bodys	<ol style="list-style-type: none"> 1. Describe the mechanism for activation and transport of fatty acids into mitochondria for catabolism. 2. Outline the sequence of reactions involved in oxidation of fatty acids in mitochondria. 3. Explain the mechanism for the formation of KBs and identify the physiological and pathological roles of those molecules. 4. Distinguish the mechanisms by which cholesterol biosynthesis is regulated by hormones and food intake. 	3 ساعة	14
امتحان	محاضرة	Final first semester exam		3 ساعة	15

20- بنية المقرر للكيمياء الحياتية العملى / المستوى الدراسى الثانى / الكورس الأول

طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Laboratory safety	<ol style="list-style-type: none"> 1- To make the students aware about the possible safety issue. 2- To describe the ideal appearance and attitude of the student during the lab time. 	2 ساعة	1

			<ul style="list-style-type: none"> 3- To describe the proper costume that the students should wear during the lab time. 4- To learn the students what they should do in case of accident . 		
امتحان	محاضرة	Collection and handling of blood samples	<ul style="list-style-type: none"> 1- To Describe how to obtain blood samples. 2- To demonstrate blood draw. 3- To identify the ideal blood draw sites. 4- To learn the student what are the blood collection tubes available and which one they should use for each group of tests. 5- To teach the students what is the anti-coagulant tubes and how does it work. 	2 ساعة	2
امتحان	محاضرة	Collection and handling of urine samples	<ul style="list-style-type: none"> 1- To describe what is the properties of the urine. 2- To make the student appreciated the importance of urine analysis. 3- To learn the student the procedure followed to analyse urine sample. 4- What is the basic types of clinically used urine samples? 	2 ساعة	3
امتحان	محاضرة	Analytical techniques and instrumentation	<ul style="list-style-type: none"> 1- To demonstrate what kind of instrument we used in clinical biochemistry lab. 2- The explain the principles of each device. 3- Explain the basic concepts of each device. 	2 ساعة	4

			4- Explain the possible mistake in using in these devices.		
امتحان	محاضرة	Glucose	<ol style="list-style-type: none"> 1- Explain the importance of Glucose test. 2- Describe the principles of glucose test. 3- The types of glucose test and the reference range . 4- The clinical significance of glucose test . 5- Cause and consequence of hyper- and hypo-glycemia. 	2 ساعة	5
امتحان	محاضرة	HbA1c	<ol style="list-style-type: none"> 1- Explain the importance of AbA1c test and what is the result means . 2- Describe the principles of HbA1c test. 3- Learn the student what is the HbA1c reference range and the interpretations the result for diabetes and non-diabetes patients . 4- The clinical significance of HbA1c test . 	2 ساعة	6
امتحان	محاضرة	Glucose tolerance test (GTT)	<ol style="list-style-type: none"> 1- Explain the importance of GTT test and what is the result means. 2- Explain in which health conditions the test should order. 3- Describe the principles of GGT test. 4- Learn the student what is the GGT reference 	2 ساعة	7

			<p>range and the interpretations the result for diabetes and non-diabetes patients.</p> <p>5- The clinical significance of GGT test .</p> <p>6- what is the pre-test preparations.</p>		
امتحان	محاضرة	Insulin and Glucagon	<ol style="list-style-type: none"> 1- Explain the importance of Insulin and Glucagon test and what is the result means. 2- Explain why the doctor's order Insulin and Glucagon test. 3- Describe the principles of Insulin and Glucagon test . 4- Learn the student what is the Insulin and Glucagon reference range and the interpretations the result for diabetes and non-diabetes patients . 5- The clinical significance of Insulin and Glucagon test. 6- what is the pre-test preparations. 	2 ساعة	8
امتحان	محاضرة	C-peptide	<ol style="list-style-type: none"> 1- Explain the importance of C-peptide test and what is the result means. 2- Explain why the doctor's order C-peptide test. 3- Describe the principles of C-peptide test. 4- Learn the student what is the C-peptide reference range and the interpretations the result for diabetes and non- 	2 ساعة	9

			<p>diabetes patients.</p> <p>5- The clinical significance of C-peptide test.</p> <p>6- What is the pre-test preparations.</p>		
امتحان	محاضرة	Plasma lipids and lipoproteins (Cholesterol and Triglyceride)	<p>1- Explain the importance of Cholesterol and Triglyceride test and what is the result means.</p> <p>2- Explain why the doctor's order Cholesterol and Triglyceride test.</p> <p>3- Describe the principles of Cholesterol and Triglyceride test.</p> <p>4- Learn the student what is the Cholesterol and Triglyceride reference range.</p> <p>5- The clinical significance of Cholesterol and Triglyceride test.</p> <p>6- What is the pre-test preparations.</p>	2 ساعة	10
امتحان	محاضرة	Plasma lipids and lipoproteins (HDL, LDL, and VLDL)	<p>1- Explain the importance of HDL, LDL, and VLDL test and what is the result means.</p> <p>2- Explain why the doctor's order HDL, LDL, and VLDL test.</p> <p>3- Describe the principles of HDL, LDL, and VLDL test.</p> <p>4- Learn the student what is the HDL, LDL, and VLDL</p>	2 ساعة	11

			<p>reference range.</p> <p>5- The clinical significance of HDL, LDL, and VLDL test.</p> <p>6- What is the pre-test preparations.</p>		
امتحان	محاضرة	Protein and albumin	<p>1- Explain the importance of Protein and albumin test and what is the result means.</p> <p>2- Explain why the doctor's order Protein and albumin test.</p> <p>3- Describe the principles of Protein and albumin test.</p> <p>4- Learn the student what is the Protein and albumin reference range.</p> <p>5- The clinical significance of Protein and albumin test.</p>	2 ساعة	12
امتحان	محاضرة	G6PDH	<p>1- Explain the importance of G6PDH test and what is the result means.</p> <p>2- Explain why the doctor's order G6PDH test.</p> <p>3- Describe the principles of G6PDH test .</p> <p>4- Learn the student what is the G6PDH reference range.</p> <p>5- The clinical significance of G6PDH test.</p>	2 ساعة	13
امتحان	محاضرة	Kidney function test (Urea Test), (Creatinine Test)	<p>1- Explain the importance of Urea test, Creatinine Test and what is the result means.</p> <p>2- Explain why the doctor's order Urea test, Creatinine Test.</p> <p>3- Describe the principles of Urea test, Creatinine Test.</p>	2 ساعة	14

			<p>4- Learn the student what is the Urea, Creatinine reference range.</p> <p>5- The clinical significance of Urea test, Creatinine Test.</p>		
امتحان	محاضرة	First- semester practical examination		2 ساعة	15

21- بنية المقرر للكيمياء الحياتية النظري / المستوى الدراسي الثاني / الكورس الثاني					
طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Amino acids and protein	<ol style="list-style-type: none"> 1. Describe factors affecting nitrogen balance in health and disease. 2. Describe the biosynthesis of melanin and catecholamine's hormones from essential amino acids. 3. Describe the biosynthesis 	3 ساعة	1

			<p>of EAAs and NEAAs from intermediates of glycolytic pathway and TCA cycle.</p> <ol style="list-style-type: none"> Describe the role of folic acid. Compare and contrast dopamine levels in Parkinson's disease. Describe the role of tyrosinase in albinism. 		
امتحان	محاضرة	Urea cycle	<ol style="list-style-type: none"> Describe the reactions of the urea cycle. List the causes of hyperammonemia and treatments to reduce blood ammonia levels. Identify the connections and common intermediates between the urea cycle and TCA cycle. 	3 ساعة	2
امتحان	محاضرة	Porphyrias	<ol style="list-style-type: none"> Describe porphyrin and heme synthesis. Describe the difference between total, direct and indirect bilirubin. Describe heme catabolism. 	3 ساعة	3
امتحان	محاضرة	Vitamins	<ol style="list-style-type: none"> Definition of vitamins. Describe the common classification of vitamins. Describe the role of vitamin A. Identify the common problems associated with vitamin A deficiency. 	3 ساعة	4

امتحان	محاضرة	Water soluble vitamins	<ol style="list-style-type: none"> 1. List the water soluble vitamins. 2. Discuss the problems associated with vitamin B deficiency. 3. List the causes of vitamin B deficiency. 	3 ساعة	5
امتحان	محاضرة	Disorders of the hypothalamus and pituitary	<ol style="list-style-type: none"> 1. Introduction to endocrinology. 2. Identify the common factors which regulate the release of anterior pituitary hormone. 3. Describe the hormones that release from the anterior pituitary gland. 4. Identify clinical problems associated with growth hormone deficiency. 	3 ساعة	6
امتحان	محاضرة	Thyroid gland	<ol style="list-style-type: none"> 1. Describe the physiology of thyroid gland. 2. Illustrate the hormones that regulate thyroid hormone secretion. 3. Discuss thyroid function test. 	3 ساعة	7
امتحان	محاضرة	Thyroid gland disease	<ol style="list-style-type: none"> 1. Definition of hypothyroidism. 2. Describe symptoms of hypothyroidism. 3. Identify the pathophysiology of hypothyroidism. 4. Diagnosis of hypothyroidism. 5. Describe factors contribute to hypothyroidism. 	3 ساعة	8

			<ol style="list-style-type: none"> 6. Identify the causes of hyperthyroidism. 7. Pathophysiology of hyperthyroidism. 8. Describe laboratory investigation of hyperthyroidism. 9. Describe the treatment of hyperthyroidism. 		
امتحان	محاضرة	Biological membrane and transport	<ol style="list-style-type: none"> 1. Describe the function of cell membrane. 2. Meaning of transport function. 3. Types of transport mechanisms. 4. Describe the factors that influence diffusion rates. 5. Describe osmolarity and tonicity. 	3 ساعة	9
امتحان	محاضرة	Liver	<ol style="list-style-type: none"> 1. Describe major function of the liver. 2. Identify the substance that are excreted by the liver. 3. Describe how jaundice occur. 4. Describe why unconjugated bilirubin occur. 5. Identify the disease of the liver. 	3 ساعة	10
امتحان	محاضرة	Kidney, Renal Failure	<ol style="list-style-type: none"> 1. General description of kidney. 2. Describe the function of kidney. 3. Identify the causes of impaired renal function. 4. Definition of acute kidney injury. 5. Identify the diagnostic feature of acute kidney injury. 	3 ساعة	11

			<ol style="list-style-type: none"> 6. Describe the phases of acute kidney injury. 7. Identify the investigation of low urinary output. 8. Describe the classification of chronic kidney injury. 		
امتحان	محاضرة	Cancer and its consequences	<ol style="list-style-type: none"> 1. General definition of cancer. 2. Describe how tumor growth effect on body organs. 3. Illustrate the symptoms of tumor. 4. Describe why renal failure occur in patient with tumor. 5. Identify cancer treatment and its consequences. 	3 ساعة	12
امتحان	محاضرة	Tumor marker	<ol style="list-style-type: none"> 1. Definition of tumor marker. 2. Illustrate uses of tumor marker. 3. Identify types of tumor marker. 	3 ساعة	13
امتحان	محاضرة	Nutrition	<ol style="list-style-type: none"> 1. Definition of nutrition . 2. Illustrate how trauma and 	3 ساعة	14

			sepsis effect on nutrition of individual . 3. Definition of starvation and under nutrition . 4. Describe nutritinal assessment .		
امتحان	محاضرة	Final second semester exam		3 ساعة	15

22- بنية المقرر للكيمياء الحياتية العملى / المستوى الدراسى الثانى / الكورس الثانى					
طريقة التقييم	طريقة التعليم	اسم الوحدة / الموضوع	اهداف التعليم المطلوبة	الساعات	الأسبوع
امتحان	محاضرة	Gout (Uric acid Test)	1- Explain the importance of Uric acid test and what is the result means. 2- Explain why the doctor's order Uric acid test. 3- Describe the principles of Uric acid test. 4- Learn the student what	2 ساعة	1

			is the Uric acid reference range. 5- The clinical significance of Uric acid test.		
امتحان	محاضرة	Liver function test LFT (Protein synthesis (albumin))	<ol style="list-style-type: none"> 1- Explain the importance of albumin test in LFT and what is the result means. 2- Explain why the doctor's order albumin test for patient has liver disease. 3- Describe the principles of albumin test. 4- Learn the student what is the albumin reference range. 5- The clinical significance of albumin test for patient has liver disease. 	2 ساعة	2
امتحان	محاضرة	Liver function test (Hepatic anion transport (bilirubin))	<ol style="list-style-type: none"> 1- Explain the importance of bilirubin test in LFT and what is the result means. 2- Explain why the doctor's order bilirubin test for patient has liver disease. 3- Describe the principles of bilirubin test. 4- What is the difference between direct and in direct bilirubin? 	2 ساعة	3

			<ul style="list-style-type: none"> 5- Learn the student what is the bilirubin reference range. 6- The clinical significance of bilirubin test for patient has liver disease. 7- How testing direct and indirect bilirubin are important for distinguish between different types of liver disease. 		
امتحان	محاضرة	Liver function test (Hepatocellular integrity (GOT and GPT))	<ul style="list-style-type: none"> 1- Explain the importance of GOT and GPT test in LFT and what is the result means. 2- Explain why the doctor's order GOT and GPT test for patient has liver disease. 3- Describe the principles of GOT and GPT test. 4- Learn the student what is the GOT and GPT reference range. 5- The clinical significance of GOT and GPT test for patient has liver disease. 	2 ساعة	4
امتحان	محاضرة	Liver function test (Presence of cholestasis (alkaline phosphatase ALP))	<ul style="list-style-type: none"> 1- Explain the importance of ALP test in LFT and what is the result means. 2- Explain why the doctor's order ALP test for patient has liver disease. 3- Describe the principles of ALP test. 4- Learn the student what is the ALP reference range. 5- The clinical significance of ALP test for patient has liver disease. 	2 ساعة	5

امتحان	محاضرة	Vitamin (Vitamin D3 Test)	<ol style="list-style-type: none"> 1- Explain the importance of Vitamin D3 test and what is the result means. 2- Explain why the doctor's order Vitamin D3. 3- Describe the principles of Vitamin D3 test . 4- Learn the student what is the Vitamin D3 reference range. 5- The clinical significance of Vitamin D3 test. 	2 ساعة	6
امتحان	محاضرة	Trace elements and metals	<ol style="list-style-type: none"> 1- Explain the importance of Trace elements and metals test and what is the result means. 2- Explain why the doctor's order Trace elements and metals test. 3- Describe the principles of Trace elements and metals test. 4- Learn the student what is the Trace elements and metals test reference range. 5- The clinical significance of Trace elements and metals test. 	2 ساعة	7
امتحان	محاضرة	Electrolytes (Calcium)	<ol style="list-style-type: none"> 1- Explain the importance of Calcium test and what is the result means. 2- Explain why the doctor's order Calcium test. 3- Describe the principles of Calcium test. 4- Learn the student what is the Calcium test reference range. 5- The clinical significance of Calcium test. 	2 ساعة	8

امتحان	محاضرة	Electrolytes (Sodium)	<ol style="list-style-type: none"> 1- Explain the importance of Sodium test and what is the result means. 2- Explain why the doctor's order Sodium test. 3- Describe the principles of Sodium test. 4- Learn the student what is the Sodium test reference range. 5- The clinical significance of Sodium test. 	2 ساعة	9
امتحان	محاضرة	Electrolytes (Potassium)	<ol style="list-style-type: none"> 1- Explain the importance of Potassium test and what is the result means. 2- Explain why the doctor's order Potassium test. 3- Describe the principles of Potassium test. 4- Learn the student what is the Potassium test reference range. 5- The clinical significance of Potassium test. 	2 ساعة	10
امتحان	محاضرة	Electrolytes (Chloride)	<ol style="list-style-type: none"> 1- Explain the importance of Chloride test and what is the result means. 2- Explain why the doctor's order Chloride test. 3- Describe the principles of Chloride test. 4- Learn the student what is the Chloride test reference range. 5- The clinical significance of Chloride test. 	2 ساعة	11

امتحان	محاضرة	Thyroid Function test T3, T4 and TSH	<ol style="list-style-type: none"> 1- Explain the importance of T3, T4 and TSH test and what is the result means. 2- Explain why the doctor's order T3, T4 and TSH test. 3- Describe the principles of T3, T4 and TSH test . 4- Learn the student what is the T3, T4 and TSH test reference range. 5- The clinical significance of T3, T4 and TSH test. 	2 ساعة	12
امتحان	محاضرة	Lipase and Amylase	<ol style="list-style-type: none"> 1- Explain the importance of Lipase and Amylase test and what is the result means. 2- Explain why the doctor's order Lipase and Amylase test. 3- Describe the principles of Lipase and Amylase test . 4- Learn the student what is the Lipase and Amylase test reference range. 5- The clinical significance of Lipase and Amylase test. 	2 ساعة	13
امتحان	محاضرة	Cardiac marker (CPK) , (Troponin)	<ol style="list-style-type: none"> 1- Explain the importance of CPK test, Troponin test and what is the result means. 2- Explain why the doctor's order CPK test, Troponin test. 3- Describe the principles of CPK test, Troponin test. 4- Learn the student what is the CPK test, Troponin test reference range. 5- The clinical significance of CPK test, Troponin test. 	2 ساعة	14

امتحان	محاضرة	First- semester practical examination	2 ساعة	15
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23- البنية التحتية لفرع الكيمياء الحياتية

- Harper's Biochemistry , 31 ST Edition , 2018	1- الكتب المقررة المطلوبة
- Lippincott Illustrated Reviews : Biochemistry , Seventh Edition , 2018 . - Lehninger Principle of Biochemistry , 4 th Edition , 2005 . - Essentials of Medical Biochemistry with clinical cases , 3 rd Edition , 2022. By N.V.Bhagavan and chury – Eun Ha.	2- المصادر الخارجية
المجلات العلمية في اختصاص الكيمياء الحياتية السريرية	أ- الكتب والمراجع التي يوصى بها (المجلات العلمية والتقارير.....)
الموقع الإلكتروني لكلية الطب بالإضافة إلى الأترنت	ب- المراجع الألكترونية ، موقع الأترنت

24 - خطة تطوير فرع الكيمياء الطبية والحياتية

تطوير المقررات الدراسية سنوياً بما يلائم التطور العالم في مجال الكيمياء الحياتية وتقنيات اجراء التحليل الكيمياوية السريرية .
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