

وزارة التعليم العالي والبحث العلمي
جامعة ديالى / كلية العلوم

المؤتمر العلمي الثاني لبحوث الدراسات العليا

تحت شعار:

بحوث الدراسات العليا ميدان خصب لتبادل الافكار
المبتكرة في مجال العلوم الصرفة والتطبيقية

ملخصات البحوث المشاركة في المؤتمر

يوم الأحد الموافق 2023/5/7
في تمام الساعة العاشرة صباحاً
وعلى قاعة الشهيد ذكاء عبد الأمير

برعاية

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أهداف المؤتمر:

- ادامة التواصل بين طلبة الدراسات العليا واطاحة فرصة التلاقح الفكري العلمي لهم.
- تعزيز منهجية البحث العلمي وتعميقها بنشر الأبحاث لطلبة الدراسات العليا.
- الاسهام بتوفير البيئة المناسبة للطلبة لتقديم تجاربهم البحثية في رسائلهم الجامعية .
- الإسهام في صقل الشخصية الأكاديمية المستقلة لطلبة الدراسات العليا من خلال بث روح العمل البحثي فيهم وتدريبهم على إجراء البحوث العلمية وعرض نتائجها في المؤتمرات.

محاور المؤتمر:

- علوم الحياة
- علوم الرياضيات
- علوم الحاسوب
- علوم الكيمياء
- فيزياء الحالة الصلبة
- جيولوجيا النفط والمعادن

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MSc. Biology			
Time	Title	Student	Supervisor
	Molecular investigation of <i>fimH</i>, <i>treC</i>, and <i>luxS</i> in <i>Klebsiella Pneumoniae</i> Isolation from Nosocomial and Community Infection in Diyala, Iraq	Ibtihal Qasim Mohamed	Hadi Rahman Rasheed AL.Taai
<p>Abstract: <i>Klebsiella pneumoniae</i> is a pertinent pathogen and cause of the nosocomial-acquired and the community-acquired pneumonia, urinary tract infections and contamination wound and burn. This study aims to compare epidemiology the nosocomial -acquired infections and community-acquired infections, and correlate <i>K. pneumoniae</i> with twelve antibiotic susceptibility, and then detect phenotyping and genotyping of biofilm and quorum sensing genes. The 250 clinical samples were isolated including: urine, sputum, and swabs of wound and burns. It was obtained that 44 <i>K. pneumoniae</i>. Divided to 24.16% (n=29) and 12% (n=15) from nosocomial acquired infection and community acquired infection, respectively. <i>K. pneumoniae</i> β-lactamase producers (ESBL, MBL, and AmpC) for both of them appeared 72.41%, 20.68%, and 34.48% while 60%, 13.33%, and 26.66%, respectively. The nosocomial acquired infections of biofilm production 26 (89.65) and 13 (86.66%) in community acquired infection. <i>k. pneumoniae</i> ESBL-PDR is highly phenotyping resistance antibiotic correlation with biofilm production, that is associated with a greater β- lactamase inhibitor combinations, cephalosporines GIII and GIV, and carbapenems than aminoglycosides, fluoroquinolones, and florate pathway antagonists. The biofilm genes (<i>fimH</i>, and <i>treC</i>) and quorum sensing gene, (<i>luxS</i>) prevalence 85.71% and 81.81% for biofilm genes and 100% for quorum sensing gene in community acquired infection and nosocomial acquired infection, respectively. The further results are described in more details in the rest of the article</p>			
MSc. Biology			
Time	Title	Student	Supervisor
	Investigation of The Prevalence of Secondary Bacterial Infection Associated with COVID-19 In Baghdad and Diyala Province	Ahmed farhan hamed	zainab mohamed alzubaidy
<p>Abstract: Coronavirus disease 2019 (COVID-19) is an epidemic disease produced via the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) beta</p>			

coronavirus, which affects the lower respiratory tract. Secondary bacterial infection (SBI) is a serious and public problem in patients hospitalized with COVID-19 and caused 50% of deaths. Type A and O blood groups are more susceptible to infection with SBIs.

The present study aimed to examine the relationship between SBI and ABO blood group with COVID-19 hospitalized patients in Baghdad and Diyala province.

Three hundred and forty-two patients with COVID-19 were collected from several sources (nasal swab, pharyngeal swab, sputum, blood, and urine) of patients of different ages for the period between September to November 2021. Real-time reverse-transcription polymerase chain reaction technique was used to diagnose COVID-19 in the patients as well as selective and differential media, biochemical tests BACT/ALERT system, and VITEK 2 compact system were used to diagnose the isolates of SBIs. The disk diffusion technique was used to assess the susceptibility test of all isolates. ABO group analysis was done for totally patients with COVID-19 under the study.

Antimicrobial sensitivity test showed all SBIs were highly strong resistant to antibiotics. Fifty-seven isolates of bacteria were diagnosed including *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Klebsiella pneumoniae*, and *Escherichia coli*. Group A and O showed a higher rate of acquired SBIs. Duration of infection with COVID-19 showed 61% for 10 days and 30% for 11-30 days while 9% in the patients infected with SBI for more than one month. The result appeared that SBIs infection at were very high rate in COVID-19 patients who had untreated antibiotics compared with the patient treated with antibiotics through the duration of infection.

The study revealed that many COVID-19 patients were more susceptible to infection with SBIs, especially in the early days of infection as well as there was a correlation between ABO blood groups and SBIs of COVID-19 patients.

MSc. Biology			
Time	Title	Student	Supervisor
	Parasitological and hematological study of children infected with intestinal parasites in Baquba city	Hasnaa Khalid Awaad	Sanaa Nagem Alhadidi
<p>Abstract: The intestinal parasite infection is a significant health issue in developing countries, particularly in tropical and subtropical areas. About 3.7 billion individuals are thought to be affected annually, most of cases are children, including children in Iraq, and Baquba city. According to researchers, the main intestinal parasites affecting humans include <i>Entamoeba histolytica</i>, and <i>Giardia lamblia</i>. The present research was conducted to evaluate the prevalence of intestinal parasitic infections that causes serious problems among children aged (>1 – 15 years old) and to investigate the relationship between parasitic infestation among children and their immunity (i.e., IgE), the levels of Vit D3, and Zinc. About 300 samples were collected from hospitalized and non-hospitalized children and 100 control. A fresh stool and blood sample were taken from each child during the period from 1st of November 2021 to 31st of May 2022. The collected samples were examined microscopically for identifying the parasite and examined for immunological and hematological parameters . The result showed a significant variation among children from different age groups, the age group (1>-5) years old had the highest infection with intestinal parasites. In terms of gender, males had the highest intestinal parasitic infections than females. The levels of Vitamin D3 and Zinc decreased in infected children with intestinal parasitic comparing to the control. While IgE indicated higher levels in infected children than in the controls</p>			
MSc. Biology			
Time	Title	Student	Supervisor
	Study ofAntibacteril activity from alcoholic extracts of Torilis arvensis(Huds)Link on Biofilm formation of Acinetobacter baumannii in Diyala province-Iraq	Muhammad Jassim Muhammd	Kareem Ibrahim Mubark
<p>Abstract: This study was conducted in Baqubah Education Hospital in Diyala/Iraq from the period 1st January to 2nd of March 2022. One hundred twenty clinical specimens from wounds and burns swab of different ages and gender and</p>			

were obtained and cultured on suitable media (Blood agar and MacConkey agar) for isolation and identification of *Acinetobacter baumannii* according to standard bacteriological techniques incubated under suitable conditions. The current study was investigated for antibiotic susceptibility test, Minimum, Sub Inhibitory concentration (MIC and SUB-MIC) of antibiotics, biofilms formation, antibacterial effect of Methanol and ethanol extracts of *Torilis arvensis* (Huds.)Link and active compounds of extract.

Under current study, Twenty isolates of *A.baumannii* were identified and which were distributed as (65 %) from wounds infections and 35% from burns infections. The Minimum Inhibitory Concentration of Meropenem and Levofloxacin ranged from 8-512 ug.m⁻¹. Antibiotics sensitivity test of bacteria revealed highly resistance for all antibiotics which were used in current study where the percentage value range from 46% for Tobramycin to 90% for Ampicillin-sulbactam and Ceftazidime, Isolates of *A.baumannii* showed high ability for biofilm formation with a ratio about 85 %. And 20 substances that were present in plant extract were detected by Gas Chromatography-mass spectrometry and recorded as active compounds.. Ethanol and methanol extracts of *Torilis arvensis* (Huds.)Link demonstrated high antibacterial activity against *A. baumannii* isolates as concentration about 200 mg.ml⁻¹. The results of the current study showed that the stimulation of *A.baumannii* isolates for biofilm formation may be affected by the both SUB-MIC of antibiotics and *Torilis arvensis* (Huds.) Link.

MSc. Biology

Time	Title	Student	Supervisor
	Study the IL6, IL2 and Biochemical Marker Associated with Covid-19 Patients in Diyala Governorate/Iraq	Mushtaq karim mash	Ibrahim Hadi Muhammed
	<p>Abstract:</p> <p>The current study was performed at Baqubah General Hospital /Diyala which included 60 patients with CoV-19 distributed on 27 males and 33 females, while 30 individuals not infected with CoV-19 (control group) who were aged between 20-65 and from a period between September 5 to December 15 /2021. All samples were already diagnosed with CoV-19 infection by using RT-PCR and IgM/IgG Rapid Test Kit. Blood samples and a nasopharyngeal swab were taken from the patients and control group to test for; iL-6, iL2, blood urea, serum creatinine and LDH. The study revealed the infection with CoV-19 showed the highest levels of iL-6 and iL2 were(71.88 and177.50) pg/ml levels respectively, the biochemical analysis also showed the highest</p>		

	levels of each blood urea, serum creatinine and LDH were (35.40, 0.80, 330.95) respectively.		
MSc. Biology			
Time	Title	Student	Supervisor
	Molecular Study of Antimicrobial Effect of Bacteriocin Isolated from Lactobacillus on Candida albicans	Noor Ali Faleh Abed	Abbas Muhei Muzher
	<p>Abstract:</p> <p>Background: It is generally known that several LAB species have antibacterial properties. Different Lactobacillus species have been shown to have anticandidal effects by numerous researchers. This genus's members benefit the vagina and gastrointestinal systems' health. Additionally, they create a variety of bacteriocins with a wide spectrum of actions against bacteria or fungi.</p> <p>Objective: examine the antifungal effects of bacteriocin produced by Lactobacillus spp. isolates against Candida spp. with the ultimate goal of gene expression on C. albicans biofilm genes before and after bacteriocin treatments.</p> <p>Method: To test the antifungal activity of lactobacilli that make bacteriocin against the yeast Candida, fifty yogurt and vaginal samples were gathered. Testing on the isolated Lactobacilli included microscopic, macroscopic, and biochemical examinations. Additionally, a screening was done to find the best producer isolation. One hundred urine samples from females of various ages were obtained for the isolation of Candida spp. All of the isolated Candida albicans were examined under a microscope, on a larger scale, and using biochemistry. Primary and secondary screening methods were used to look into the detection of bacteriocin formation from Lactobacillus. The expression of the ALS1 gene before and after treatment with bacteriocin was compared using reverse transcription quantitative polymerase chain reaction (RT-qPCR).</p> <p>Results: .The agar wells diffusion technique was the most effective, according to the results. The results show that folding of this gene was reduced after bacteriocin treatment which means that bacteriocin inhibits the gene expression of biofilm formation of C. albicans.</p>		

MSc. Biology			
Time	Title	Student	Supervisor
	الكشف عن التعبير الجيني لمضخات الدفع في الشيرشيا القولونية المعزولة من التهاب المسالك البولية عند الأطفال و	وداد عادل كاظم	كريم ابراهيم مبارك
<p>Abstract:</p> <p>تم جمع ٨٧ عينة سريرية من عينات البول في منتصف الجريان من مرضى الأطفال المصابين بعدوى المسالك البولية ، وتم زرع جميع العينات على وسط مناسب لعزلها ، وتم تأكيد تشخيصها بواسطة الاختبارات البيوكيميائية ، ونظام VITEK-2. حيث تم الحصول على (7.28%) 25% عزلة من الشيرشيا القولونية. أظهر اختبار الحساسية للمضادات الحياة أن عزالت coli.Escherichia كانت عالية المقاومة لمعظم المضادات الحيوية المستخدمة ووجود مقاومة متعددة لأدوية. بلغت نسبة انتشار مضخات الدفع 60%. أظهرت الدراسة الحالية للكشف الجزيئي عن جينات مضخات الدفع عن وجود جينات acrA و acrB في جميع العزالت (100 ،)%. كما أظهرت الدراسة تثبيط التعبير الجيني لجينات acrB,acrA بعد معاملة العزالت البكتيرية ب. Ciprofloxacin MIC-Sub.</p>			
MSc. Biology			
Time	Title	Student	Supervisor
	Evaluation of Serum Cytokine Levels in Hemodialysis Patients With Uremic Pruritus	Safaa Shehab Ahmed	Mohammed Abdul-Daim Saleh
<p>Abstract:</p> <p>Uremic pruritus (UP) is a common, troubling and in some cases a debilitating problem for patients with chronic kidney disease (CKD), end-stage renal disease (ESRD) as well as those maintained on hemodialysis (HD) or peritoneal dialysis (PD). This study aims to assess the serum interleukin-6 (IL-6), interleukin-13 (IL-13), and tumor necrosis factor-alpha (TNF-α) in HD patients with UP.</p> <p>The study was performed between 4th October 2021 – 5th March 2022 on 60 HD patients, who suffer from UP, and 30 healthy controls in Baqubah Teaching Hospital-Ibn Sina Dialysis Center. The findings of our investigation revealed that the serum IL-6, IL-13, and TNF-α levels were significantly greater in HD patients with UP (95.67 ± 11.91, 16.11 ± 2.28 pg/ml, 148.16 ± 15.39 pg/ml, respectively) as compared with healthy controls (37.82 ± 2.38 pg/ml, 5.80 ± 0.26 pg/ml, 65.11 ± 2.98 pg/ml, respectively) ($P = < 0.001$). Furthermore, serum levels of IL-13 and TNF-α increased significantly in severe itch patient groups ($P = 0.001$ and 0.003, respectively), whereas the difference in serum IL-6 levels between the severe,</p>			

moderate, and mild itch patient groups was statistically insignificant ($P = 0.249$).

Bivariate pearson correlation was used to test the correlation between IL-6, IL-13, and TNF- α . The results showed that IL-6 had a statistically significant correlation with IL-13 ($r = 0.693^{**}$; $P = < 0.001$) and TNF- α ($r = 0.736^{**}$; $P = < 0.001$). Furthermore, there was a statistically significant correlation between TNF- α and IL-13 ($r = 0.875^{**}$; $P = < 0.001$).

MSc. Chemistry			
Time	Title	Student	Supervisor
	Removal of methyl orange dye using (ZnO/MWCNTs) nanomaterial	Esraa Ibrahim mahmoud	Amir fahdil Dawood
<p>Abstract: The (ZnO/MWCNTs) Nano composite had a composition of (0.8/0.018MWCNTs) (w/w). Batch adsorption method was used to remove Methyl orange dye from its aqueous solution. The structural characteristics of (ZnO/MWCNTs) were investigated (FTIR, XRD, BET, EDX, FE-SEM). The (ZnO) was discovered to have a 22 nm average particle size with surface area (27. 71m².g⁻¹). The (ZnO/MWCNTs) was discovered to have a surface area (38. 85m².g⁻¹). Adsorption equilibrium data was fitted with, Temkin equations to describe the isotherms, more than Freundlich, and Langmuir and Dubinin-Radushkevich isotherms. Thermodynamic studies showed that the adsorption was exothermic and spontaneous and physisorption nature of adsorption. The pseudo-first and second order models were used to fit the kinetic data, adsorption process flow the pseudo-second-order adsorption</p>			
MSc. Chemistry			
Time	Title	Student	Supervisor
	New Bioactive Aromatic Indole Molecules with Monosaccharide Core	Israa Nadim Hamdi Mahmood	Salih Mahdi Salman
<p>Abstract: 1,1,2-trimethyl-1H-benzo[e]indole is an important heterocyclic compound, it is available in reasonable price and can easily be modified to make a good intermediate for synthesis of other derivatives. It can be used as a starting material for the synthesis of a new series of compounds by coupling with other biomolecules such as monosaccharide amines after a simple modification. The current work aims to synthesize new potentially bioactive compounds by coupling 1,1,2-trimethyl-1H-benzo[e]indole with one or two molecules of both 2-deoxy-2-amino-D-glucose and 6-deoxy-6-amino-D-glucose. The mono-substituted derivative were prepared in two steps, the first step is the functionalization reaction to create two reaction centers via the treatment of 1,1,2-trimethyl-1H-benzo[e]indole (1) with POCl₃ to produce 2-(1,1-dimethyl-1H-benzo[e]indol-2(3H)-ylidene) malonaldehyde (2) with two reaction centers represented by aldehyde groups, while in the</p>			

second step the latter was coupled with two amino sugars. Four new molecules resulted from this reaction, two mono-substituted derivatives (3,5) when we apply the last reaction for a short time, while the di-substituted molecules (4,6) take long time for the same reaction conditions in order to overcome the steric hindrance at one reaction center. The purity and characterization of the target molecules were confirmed using spectroscopic methods including ^1H NMR and ^{13}C NMR. The synthesized compounds, especially the di-substituted derivatives, show a good biological activity as antibacterial and antifungal agents and they can find their way in medical application as they are soluble in water due to the presences of sugar moiety in their structures.

MSc. Chemistry

Time	Title	Student	Supervisor
	Synthesis and characterization of (GO-MgO-PoPDA- PVA) quaternary nanocomposite film with thermal conductivity performance	Tabark Ahmed Jassim	عامر فاضل داود
	Abstract: In this work, a pure polyvinyl alcohol (PVA) polymer film reinforced with magnesium oxide (MgO), graphene oxide (GO) and poly(o-phenylene diamine) (PoPDA) with different weight ratios (0, 2, 4, 6, 8, 10 wt%) prepared by the solution casting method. Fourier-transform infrared spectroscopy (FTIR), scanning electron microscope (SEM) and X-ray were used to characterize the nanocomposite. And study the thermal conductivity for the quaternary hybrid composite films (GO -MgO-PoPDA-PVA), it was noticed that there is a rise in the rate of the thermal conductivity coefficient (k) with a rise in the weight ratios of reinforcement.		

MSc. Chemistry

Time	Title	Student	Supervisor
	Use the Alteration of Serum Omentin-1 as Predictors for Nonalcoholic Fatty Liver Disease	Haneen Hassan ali	Khalid Shaalan Sahab
	Abstract: Non-alcoholic fatty liver disease (NAFLD) is an accumulation of triglycerides in the cells of liver without inflammation or damage to cells of liver in people who don't drink alcohol. The current study aimed to estimation of Omentin-1, insulin, Aspartate aminotransferase (AST), Alanine aminotransferase (ALT), Alkaline phosphatase (ALK), random blood sugar		

(RBS), Albumin (ALB), Total Protein, globulin, triglycerides(TG), total cholesterol(TC), high-density lipoprotein (HDL), low-density lipoprotein(LDL), very low-density lipoprotein(VLDL) in the blood of patients suffering from Nonalcoholic Fatty Liver, and detecting the alteration of the ratio in the omentin-1 and other biochemical parameters in patients and comparing it with the healthy ones. Sixty patients with NAFLD recruited in Al-Muqudadia General Hospital/ Diyala Governorate- Iraq for the period 1/10/2021 - 30/12/2021. Thirty healthy individuals were volunteer as control group. The ELISA Kit was used to measure serum omentin-1. A rapid quantitative assay HS-INSULIN-CHECK-1 is used to detection of insulin in serum. AST, ALT, ALK, Albumin, Globulin and Total Protein were measured by use commercial available laboratory kits .The serum RBS, TG, TC, and HDL tests were assessed using an automated chemical analyzer COBS 411.The levels of serum omentin-1 in NAFLD patients was significantly higher than that of the healthy subjects ($p<0.05$). There were a significant elevation ($p<0.05$) in mean value of ALT and AST in patients (27.91 ± 12.88 and 31.13 ± 10.85) in comparison to controls (18.05 ± 5.72 and 23.05 ± 6.80) respectively. The ALK and albumin levels were increased nonsignificantly in patients compared to controls ($p>0.05$). The results of total protein, RBS , insulin and globulin, showed non-significant elevation in patients compared to healthy group ($p>0.05$). There were substantial significant elevation ($p<0.05$) of serum TC, TG, LDL, and VLDL, in patients in comparison to control group while HDL levels were non significantly decreased. The concentration of serum omentin-1, on the other hand, had higher area under curve(AUC) and sensitivity in ROC curve in comparison to other biochemical parameters. Omentin-1 levels were significantly elevated in patients of NAFLD and had higher AUC and sensitivity in ROC curve. Therefore, the increasing of serum omentin-1 (with increase serum TC, TG, LDL, VLDL and liver functions parameters) may be a positive predictor in patients of non-alcoholic fatty liver disease.

MSc. Chemistry			
Time	Title	Student	Supervisor
	Synthesis, Characterization and Biological activity of New Indole Schiff Bases, Derived From 2-(5-Bromo-3,3-dimethyl- 1,3-dihydro-indol-2-ylidene)-Malonaldehyde with Substituted aniline	Hawraa Hussein Khudhayer	Fadhil Lafta Faraj
<p>Abstract: New Schiff Bases have been synthesized by reaction of 2-(5-bromo-3,3-dimethyl-1,3-dihydro-indol-2-ylidene)-malonaldehyde with substituted aniline. The chemical purity structures of the new synthesized compounds was observed by TLC and the chemical structures were characterized by FT-IR, ¹H, NMR. New compounds were screened for their antibacterial activity against E. coli and S. aureus by the agar well diffusion method, which revealed different results.</p>			
MSc. Chemistry			
Time	Title	Student	Supervisor
	Corrosion inhibition of mild steel in (1 M HCl) solution using plant extract and the synergistic effect of iodide ions	safaa Ibrahim Daaj	Ahmed Najem Abd
<p>Abstract: The corrosion inhibitive impacts of a mixture (4:1) of <i>Citrus Limon leaf</i> (CLL) extract and potassium iodide additives when the mild steel was exposed to the corrosive solution (1M HCl) were evaluated using the weight-loss method at temperatures of (303, 313, 323, and 333) K. It was noted that the mixture acts as an inhibitor of mild steel corrosion at concentrations of (1.25, 2.5, 3.75, 5, and 6.25) ml/L. It was observed also that the inhibition efficiency (%IE) of the mixture increased with an increase in temperature in the presence of the synergistic effect of the iodide ion. It was found that at the highest mixture concentrations and temperatures, the inhibition competence increased to 95.20%. Inhibitor adsorption characteristics were reached by the Langmuir isotherm and were compatible. The adsorption thermodynamic parameters that were calculated supported the mixed-adsorption of the mixture on a mild steel surface. A surface analysis technique (SEM) used to confirm the occurrence of an adsorption process on the surface</p>			

MSc. Chemistry			
Time	Title	Student	Supervisor
	Synthesis, Characterization and Cytotoxicity Activity Study of Some Chalcones Derived from 2-(1,1-dimethyl-1,3-dihydro-2H-benzo[e]indol-2-ylidene)malonaldehyde	Dhuha salih Mohammad	Wassan Baqir Ali
<p>Abstract: In this work, series of new chalcones derived from indole compounds were synthesized. In the first the compound 2-(1,1-dimethyl-1,3-dihydro-2H-benzo[e]indol-2-ylidene)malonaldehyde was synthesized from the reaction of 1,1,2-trimethyl-1H-benzo[e]indole with Phosphoryl chloride in the presence of (DMF). Schiff base (C2) was prepared by reaction of 2-(1,1-dimethyl-1,3-dihydro-2Hbenzo[e]indol-2-ylidene) malonaldehyde with 3-amino acetophenone and then the compounds (C3-C6) were synthesized by reacting compound (C2) with a different aryl aldehyde in the presence of potassium hydroxide. The chemical composition of the compounds was confirmed and characterized by spectroscopic techniques (FT-IR, 1H-NMR and 13C-NMR). Target compounds with different concentrations were investigated for their cytotoxic activity against the human breast cancer cell line MCF7. The results showed that the compounds had promising cytotoxic activity against MCF7 cell line especially compound (2) which showed the highest inhibition at the rate of 100 µg/mL among the tested compounds at varied concentrations.</p>			
MSc. Chemistry			
Time	Title	Student	Supervisor
	Synthesis and Biological Evaluation of Ligand (E)-1,1-dimethyl-2-(7-methyl-3H-benzo[b][1,4] diazepin-3-ylidene)-2,3-dihydro-1H-benzo[e]indole and its complexes with some metal(II) ions	Adel Salim Khayoon	Areej Ali Jarullah
<p>Abstract: Complexes of Co(II), Ni(II), Cu(II) Zn(II), and Cd (II) with the ligand 3-(((2-amino-4-methylphenyl)imino)methyl)-4H-chromen-4-one derived 3-formyl chromone with 4-methyl-O-phenylenediamine were synthesized and characterized by elemental analysis, FTIR, electronic spectra, magnetic</p>			

	moment and molar conductance. The prepared complexes have the general formulae $[M(C_{17}H_{14}N_2O_2)_2]Cl_2$, $M = Co(II), Ni(II), Cu(II)$ and $Zn(II)$ except complex of cadmium it have the formulae $[Cd(C_{17}H_{14}N_2O_2)Cl]Cl$. The data which obtain from analysis indicate that the complexes have octahedral geometry around the metal center except cadmium complex exhibit tetrahedral geometry. Two types of bacteria (<i>E.coli</i>) and (<i>S. aureus</i>) used to estimate the biological activities of complexes		
MSc. Chemistry			
Time	Title	Student	Supervisor
	Immobilization of Urease onto Nanochitosan Enhanced the Enzyme Efficiency: Biophysical Studies and in Vitro Clinical Application on Nephropathy Diabetic Iraqi Patients	Ali Amjad Taha	Ahmed Najem Abd
	<p>Abstract: Immobilization of enzymes is an effective method for improving the properties and applications of modern enzymes. there are several supports for enzyme immobilization. Because of its unique features, such as inertness and high surface area, chitosan was widely used to immobilize enzymes. Immobilization of urease onto chitosan is a promising approach to treating high urea levels in the blood, however, the immobilization conditions for the best kinetics and enzyme efficiency are still challenging. Herein, we tried to immobilize urease onto nanochitosan (chitosan NPs) through a cross-linker and study the kinetics (k_m and v_{max} values) and thermodynamics (E_a, ΔH, ΔS, and ΔG) parameters of the enzyme reaction before and after immobilization at different substrate concentration (50, 100, 150, 200, and 250 mg/dl) and incubation temperature (15, 20, 25, 30, 35, and 40°C) under selected optimum conditions. The immobilized urease chitosan NPs was characterized in our previous work using Fourier transform infrared (FTIR), Atomic force force microscopy (AFM), and imaged here by scanning electron microscopy (SEM). Results revealed that the highest efficiency % of immobilization (70.38%) was observed at 750 mg/ml chitosan NPs and phosphate buffer pH 7 at 40°C. With an increase of K_m value for the immobilized enzyme, however, the efficiency of the</p>		

enzyme was significantly higher than the free enzyme, $p < 0.001$. In addition, the activation energy of the reaction catalyzed by the immobilized enzyme was lower than that of the free enzyme, which suggests that the active site geometry of the immobilized enzyme was more favorable to accommodate the substrate and thus required less energy than that of the free enzyme. The reaction was endothermic by means of positive ΔH . The immobilized urease enzyme was in vitro applied to blood samples of Iraq nephropathy diabetic patients ($n = 35$) to investigate the effect on serum urease activity and urea level compared to healthy volunteers. Interestingly, the activity of serum urease significantly increased after adding the immobilized enzyme and the level of urea significantly decreased ($p < 0.0001$) by ~ 1.5 folds. us, applying an immobilized urease to remove urea from blood could be effective in the blood detoxification or dialysis regeneration system of artificial kidney machines.

MSc. Chemistry

Time	Title	Student	Supervisor
	Study Some Physical and Chemical Properties of Three Water Purification Stations in Baquba District, Diyala Governorate, Iraq	Lamie.Talal.Hassan	Amir.Fahdil.Dawood
	<p>Abstract: The research is a study of Some physical and chemical in three water purification plants in Baquba district, Diyala governorate, which are supplied with water from the Khurasan River, which springs from Lake Hamrin. 2022, and the results showed that the values of pH concentration fall within the weak basal side of the three stations for a period of four months, as the neutral ratio of pH is ($pH=7$). The study found that all water purification plants contained poor amounts of dissolved oxygen and recorded similar values 5.9-8.1(mg/l) over a period of four months. for the Abdul Hamid filtering plant, the potassium and magnesium concentration ratios showed that the most percentage of potassium is (4.6) mg/l for the Zahra refinery after purification, and the lowest percentage recorded was in the Baquba A project filtering plant For the central (0.9) mg / 1, the values of the concentration of the magnesium element were acceptable and within the standard limits of the World Health Organization (WHO), and the water turbidity varied between acceptable and unacceptable from one site to another, as the highest value was recorded (8.3)</p>		

NTU for a project filtering station With the central penalty and the lowest value was (0.5 NTU) for the Zahra filter station, the phosphate ion values showed that they are acceptable, as the values were recorded between 0.2-0.07 mg/l for all stations, and the chloride ion values were acceptable and within the specifications, as the highest value was recorded (70) mg/l For Abdul Hamid filtering station, the minimum value is (40) mg/L. The values of total dissolved solids (TDS) for the three stations for a period of four months showed that they are in agreement with the specifications of the World Health Organization, as the highest value was recorded (606) mg/L for the Abdul Hamid filtering station and the lowest value (338) mg/L for the Baquba Central Project liquidation station.

MSc. Chemistry

Time	Title	Student	Supervisor
	Synthesis and characterization of a new ligand(E)-2-(4-((2-(2-((2-hydroxynaphthalen-1-yl) methylene) hydrazinyl) thiazol-4-yl) amino) phenyl) acetic acid, and its complexes	Nidhal Meteab khamees	Areej Ali Jarullah
	<p>Abstract:</p> <p>In this research, a new heterocyclic compound (E)-2-(4-((2-(2-((2-hydroxynaphthalen-1-yl) methylene) hydrazinyl) thiazol-4-yl) amino) phenyl) acetic acid was synthesized from the reaction of 2-hydroxynaphthalene-1-carbaldehyde with 2-(4-((2-hydrazinylthiazol-4-yl)amino)phenyl)acetic acid. This compound was utilized as the ligand (HL) to synthesize series of complexes by its reaction with some metals elements salts (cobalt chloride hexahydrate, nickel chloride hexahydrate, copper chloride dihydrate and anhydrous zinc chloride). The ligand was characterized using different types of analytical techniques such as FT-IR, ¹H-NMR, mass spectrum and UV-Vis. spectrum. The complexes were characterized by using UV-Vis- spectrum, LC.-MS. technique, FT-IR spectrophotometer, conductivity measurements, magnetic susceptibility and atomic absorption. The results of the analysis revealed that the final structures of the complexes are octahedral.</p>		

MSc. Chemistry			
Time	Title	Student	Supervisor
	Corrosion Inhibition Of Aluminum IN HCL Acid Medium By Ketoprofen Expired Drug	Noor Ismaeel Khaleel	Ahmed Najim Abd
<p>Abstract: In 0.5M HCL acid medium, expired ketoprofen was tested using chemical, electrochemical, and FESEM techniques at various concentrations and temperatures as an aluminum corrosion inhibitor. The outcome shows that when inhibitor concentration rises, so does inhibition effectiveness. Electrochemical According to studies, expired medication functions as a mixed sort of inhibitor. The findings demonstrate that inhibition occurs. The corrosion process's mechanism is changed by the inhibitor's adsorption on the metal surface. The According to Langmuir's adsorption isotherm, ketoprofen is absorbed. Temperature-related variables They were deliberate and calculated. The information gathered using the investigated strategies is highly congruent with Verify the efficacy of employing expired ketoprofen drugs as powerful HCL corrosion inhibitors for aluminum.</p>			
MSc. Chemistry			
Time	Title	Student	Supervisor
	Removing pollutants from wastewater using an advanced method	Hawraa A. Kadim	Ahmed N. Abd
<p>Abstract: Purpose: Preparation of Nano cellulose from cotton lint and pear peels instead of throwing it as waste and cause damage to environment and Comparison between the efficiency of the product of Nano cellulose prepared from cotton lint and NC prepared from pear peels through the characterization of both type of NC by using technique Field emission scanning electron microscopy (FESEM) . finally Applying Murexide dye from the aqueous solution to the surface of both types of extracted Nano cellulose from cotton lint and pear peels for industrial Methodology: Agricultural wastes is the: cotton lint collected from Diyala, Iraq. Linter is an important by product of the textile industry and pear peels collected from Local market of Iraq as raw material to synthesis of Nano cellulose compound Extraction of cellulose from the cotton lint in several</p>			

steps as follows: A: Purification step B: Grinding step preparation NC product: The product has been prepared by acid hydrolysis.

Results and Discussion: In the present study, nanocellulose was successfully isolated from various plant fiber sources (cotton lint and pear peels) using acid hydrolysis . The results indicate that the FE-SEM formation of cellulose nano particles followed this method. However, the best results under sonication conditions used are coming from treatment of 30% acid hydrolysis sonicated for 120 min. Nanocellulose for cotton lint is more efficient than nanocellulose for pear peels in removing murexide dye from the aqueous solution, because percentage of the removal of murexide dye from the aqueous solution by NC of cotton lint is higher than the percentage of the removal of murexide dye from the aqueous solution by pear peels. Therefore, nanocellulose for cotton lint will be more efficient in removing pollutants from water.

MSc. Computer Science			
Time	Title	Student	Supervisor
	ATTRIBUTION CLASSIFICATION METHOD OF ADVANCED PERSISTENT THREAT (APT) MALWARE USING AI LEARNING	Eman Jalal Khalefa	Dhahir Abdulhade Abdulah
<p>Abstract:</p> <p>APT is a frequent and expensive system attack. Businesses, governments, and other organizations must defend against this attack. Utilizing machine learning or deep learning algorithms to scan network traffic for signals and anomalies to detect and thwart APT attacks has become commonplace. The lack of specific attack campaign data hinders APT behaviour analysis and evaluation methods. Network traffic analysis can help detect APT attacks. This paper proposes two adaptable strategies. Machine learning and deep learning algorithms classify APT Malware. Binary-class classification identifies two-class APT Malware and ordinary Malware; multiclass classification identifies 15 APT malware organizations and normal Malware. Each system has two classification subsystems: machine learning based on Random Forest and LightGBM algorithms and deep learning using a hybrid CNN and long short-term memory (LSTM). EDA (exploratory data analysis) detects and removes outlier data, ETC selects essential features, and SMOTE solves unbalanced data problems. APT Malware dataset with 11,107 samples in 16 classes. Each proposed system is studied separately, and machine and deep learning accuracy results are compared. Four case studies were also conducted to evaluate machine learning algorithm performance and the impact of feature selection and SMOTE technology. Machine learning results showed the effect of feature selection and SMOTE on both proposed systems. The binary class classification system results show that machine learning outperforms deep learning, with random forest accuracy of 0.999723, Light GBM accuracy of 0.999480, and CNN-LSTM hybrid accuracy of 0.914798. The multi-class classification system showed that machine learning performs better than deep learning; Light GBM has an accuracy of 0.999727, random forest is 0.999632, and CNN-LSTM is 0.798206.</p>			

MSc. Computer Science			
Time	Title	Student	Supervisor
	Automatic tuning of the PID controller based on the Artificial gorilla troops optimizer	Israa Ahmed Abbas	Muntadher khamees
<p>Abstract: Abstract: Tuning a PID controller is a crucial task in control engineering to achieve optimal performance of the system. However, manual tuning of PID parameters can be inaccurate and difficult without extensive experience. One approach to tuning the PID controller is by utilizing met heuristic algorithms. These algorithms are based on natural phenomena and can efficiently search for the optimal set of PID parameters. Therefore, utilizing met heuristic algorithms for tuning PID controllers can significantly improve the system's performance and reduce costs associated with manual tuning. In this paper, proposed a new methods for tuning parameters of the PID controller of DC motors using a hybrid adaptive PID_GTO predictive model based on the artificial gorilla troops optimizer algorithm(GTO) .The empirical results are compared based on four type of error indicator functions ,Integral Time Squared Error (ITSE) , Integral Time Absolute Error (ITAE), Integral Absolute Error (IAE) , and Integral Squared Error (ISE) and with other previously techniques in literatures, such as the Ziegler-Nichols and PSO Optimizer algorithm. The empirical results show that this method outperforms other techniques in improving steady-state error, stability, overshoot, rising time, and settling time of the DC motor.</p>			
MSc. Computer Science			
Time	Title	Student	Supervisor
	Contactless Palmprint Recognition using Deep Learning Technology	Salam Jabbar Abdu- alKadhm	Taha Mohammad Hasan
<p>Abstract: The interest of researchers in the subject of biometrics has increased, which has opened new horizons in people identification systems, and one of these measurements is the contactless palm print. Identification of people through a contactless palm print is very important in the process of identifying terrorists and criminals whose faces are often covered. Therefore, a contactless palm print recognition system has been proposed through two pre-processing methods using a neural network. A Contrast Limited</p>			

	Adaptive Histogram Equalization (CLAHE) filter was used in the first processing of the data stage as well as the normalization method. The system was applied to several databases, including the standard Indian Institute of Technology Delhi (IITD) ones, and those collected from the Computer Department, College of Science, University of Diyala, After the process of data division, training and testing, the proposed system reached satisfactory results compared to previous work, and the accuracy was 99.95.		
MSc. Computer Science			
Time	Title	Student	Supervisor
	Phylogenetic Tree Construction of Gamma Coronavirus Genera and SARS-CoV-2	Alaa Khudair Abbas	Bashar Talib
	<p>Abstract:</p> <p>The outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19), has spread worldwide. Therefore, this study aimed to build a phylogenetic tree of complete genomes of SARS-CoV-2 and other species of Gamma coronavirus to explore the possibility of finding the evolutionary relationships between them and wished to analyze them in order to forecast the best trees illustrating the sequences' evolutionary relationships and obtain a well-supported phylogenetic tree by using the Neighbor-Joining (NJ) and Maximum Likelihood (ML) methods after performing multiple sequence alignment (MSA). This study utilized 16 isolates of Gamma coronavirus species and SARS-CoV-2 retrieved from the NCBI (National Center for Biotechnology Information) database for this investigation. The experimental outcomes when applying the two methods to the same dataset show that a well-supported and trustworthy phylogenetic tree was obtained with a bootstrapping value of 100% for all branches of the tree when applying the ML method. Additionally, a well-supported and fast-constructing phylogenetic tree was obtained through the NJ method for all branches except one, where the bootstrapping value appeared to be 56%. The research was conducted in 2022 at the College of Science, Diyala University</p>		

MSc. Computer Science			
Time	Title	Student	Supervisor
	Detection of Violence Behavior using Deep Learning Technique	Mohamed Safaa Mohamed Shubber	Ziyad Tariq Mustafa
<p>Abstract: Violence detection aims at recognizing whether a violent action has happened. This field gained widespread popularity since there is a need to find applicable and automatic violence detection methods which explored visual data received from surveillance cameras installed in different areas. In this paper, a modified pre-trained deep neural networks CNN-VGG16 is employed to implement a low-complexity model for violence detection. The extracted features from pre-trained models have been flatten and fed into a fully connected network in order to detect whether a violent action has occurred. Transfer learning is applied to take advantage of the pre knowledge VGG16 has in detecting shapes and edges. The effectiveness of the method is evaluated on two public datasets. The experimental accuracy results proved the efficiency of the low-complexity proposed approach in comparison with other approaches. Also In this paper, this effect of applying edges detector on classification accuracy results and processing time for training the model is observed.</p>			
MSc. Computer Science			
Time	Title	Student	Supervisor
	GTA-3D DL: Greedy Training Approach of 3D Deep Learning for COVID-19 Diagnosis Using CT Scan	Maysam Alwan Hasson	Taha Mohammed Hassan
<p>Abstract: A numeral of deep learning models has been suggested for COVID-19 examination in computed tomography (CT) scans as an automation tool to help in diagnosis. Although, deep learning models achieved high accuracy, but training approaches are still inefficient to detect infections due to some deep learning models did not meet the requirement of a generalization term in deep learning. Furthermore, other traditional algorithms achieved low detection for 3D CT. Therefore, is high time to develop a deep learning model to diagnose COVID-19 infections in a regularization mode. In this research,</p>			

<p>greedy learning approach (GLA) is utilized to design and implement the 3D convolutional neural network (3D CNN) model, greedy learning approach is consisting of two stages; the first stage generates many 3D CNN models based on the randomness in the layers, for providing many movements toward solving one problem which is diagnosing COVID-19. Then, the second stage selects an optimal 3D CNN model based on high accuracy of 3D CNNs obtained in the first stage, optimal 3D CNN model is to be significant solution among them. We evaluate the proposed approach on the 3D Mosmed-1110 and 2D SARS-CoV-2 CT Datasets, the best accuracy scores obtained by the present approach are 1.00% and 98.87% respectively on the said datasets in terms of metrics, such as accuracy, precision, recall, and F1. The proposed system also exhibited good generalization and robustness, when it was trained and tested using a portion of data (80%) and (20%).</p>			
MSc. Computer Science			
Time	Title	Student	Supervisor
	Electrocardiogram ECG For Human Identification Based on Machine Learning Techniques and deep learning	Nada Mahmood Hameed	Jamal Mustafa Al-Tuwajari
<p>Abstract: Electrocardiogram (ECG) data are vital signs with distinct characteristics that can be collected despite time and place limitations. Because of these benefits, it has been widely used in security and medical fields. In this scientific paper, present a biometric security system that works on electrocardiography based on two internal models, one of which supports deep learning through the use of one neural network algorithm and the other model supports machine learning through three algorithms. The goal is to prove the importance of these two technologies in ECG and also design a solid and realistic security system The work was done by using the PTB data set, with accuracy (99.98) in the CNN algorithm, and with accuracy up to (Decision tree=0.94, Support Vector=100, Navy base=0.92) in learning position.</p>			

MSc. Computer Science			
Time	Title	Student	Supervisor
	Modeling of Human activity prediction in Healthcare Internet of Things (IoT) System	hala muhanad yousef	Dhahir Abdulhade Abdulah
<p>Abstract: The life of people can be improved simply and conveniently through the use of the Internet of Things (IoT). The healthcare sector is considered to be one of the most encouraging IoT applications. In the current paper, a predicted model of a healthcare A suggested Internet of Things (IoT) system uses distinct Markov state-space models to explain it. Here, a device-free human identification approach is proposed after a real-time RSSI link quality assessment technique. Using only RSSI volatility, this proposed approach achieves the same function as conventional solutions that use a complex set of motion sensors. The environment and other elements cause RSSI fluctuation, Experimental findings demonstrate the ambiguity of RSSI change when people move across the network area and support the applicability of the detection and prediction approach.</p>			
MSc. Computer Science			
Time	Title	Student	Supervisor
	Image Captioning Generator Using Deep Learning Models: An Abbreviated Survey	Yasir Hameed Zaidan	Jumana Waleed
<p>Abstract: Captioning an image is the process of using a visual comprehension system with a model of language, by which we can construct sentences that are meaningful and syntactically accurate. These accurate phrases can explain the natural language (The seen content of the image). As a relatively young field of study, it is gaining growing attention. To accomplish image caption, semantic information about the images must be gathered and conveyed in natural language. Computer vision and natural language processing are both used in the difficult task of image captioning. That issue has received a lot of proposals for solutions. An abbreviated survey of image captioning studies is given in this paper. We concentrate our efforts on neural network-based approaches that deliver current outcomes. Neural network-based techniques are broken down into subcategories in accordance with the implementation architecture. The most recent methodologies are then</p>			

	compared to normative data sets. Methods based on neural networks are classified into subcategories according to the framework being used.		
MSc. Computer Science			
Time	Title	Student	Supervisor
	Cost Prediction for Roads Construction using Machine Learning Models	Yasamin Ghadbhan Abed	Taha Mohammed Hasan
	<p>Abstract:</p> <p>Predicting conceptual costs is among the essential criteria in project decision-making at the early stages of civil engineering disciplines. The cost estimation model availability that may help in the early stages of a project could be incredibly advantageous in respect of cost alternatives and more extraordinary cost-effective solutions periodically. There is a lack of case datasets. Most of the proposed dataset was inefficient. This study offers a new data set that includes the elements of road construction and economic advantages in the year of project construction. Real project data for rural roads in the State of Iraq / Diyala Governorate for the years 2012 to 2021 have use to train a predictive model with a high rate of accuracy based on machine learning (ML) methods. Ridge and Least Absolute Shrinkage and Selection Operator (LASSO) Regressions, K Nearest Neighbors (k-NN), and Random Forest (RF) algorithms have employ to create models for estimating road construction costs based on real-world data. The Root Mean Square Error (RMSE), Mean Absolute Percentage Error (MAPE), and R-squared (R²) coefficient of determination are utilize to assess the models' performance. The analysis indicated that the RR is the best model for road construction costs, with results R² = 1.0, MAPE =0.00, and RMSE=0.00. The results showed that the cost estimates were accurate and aligned with the project bids.</p>		

MSc. Mathematics			
Time	Title	Student	Supervisor
	Polynomial approximation of an inverse Cauchy problem for Helmholtz Type equations	Ibtihal Thabit Jameel	Fatima Mohammed Aboud
<p>Abstract:</p> <p>This paper aims to solve numerically an inverse Cauchy problem defined on a two-dimensional domain occupied by a material satisfying the Helmholtz type equations benefiting from the additional Cauchy data on the accessible part of the boundary. A meshless numerical method proceeds by using an approximation of the solution based on the polynomial expansion. To confirm the efficiency of the proposed method, different examples considered and the obtained linear system solved using the well-known CGM and CGLS algorithms. The stability of the method was checked by applying different noise parameter. To avoid the severe ill-condition property of the inverse Cauchy problems, regularization and preconditioning were applied to obtain a better accuracy for each CGM and CGLS</p>			
MSc Mathematics			
Time	Title	Student	Supervisor
	Efficient Solutions for Multi-Criteria Sequencing Problem by Using Modified Algorithm	Wasfaa Ebrahim Ahmed	Adawiya Ali Mahmood
<p>Abstract:</p> <p>For multi criteria sequencing problem on one machine , we propose a modified branch and bound algorithm (MBAB) to find efficient (pareto optimal) solutions in this paper. The criteria are total completion time ($\sum C_j$), total lateness($\sum L_j$), and maximum tardiness (T_{max}). A collection of n independent tasks(jobs) has to be sequenced on one machine , tasks(jobs)_j (j=1,2,3,...,n) requires processing time P_j and due data d_j . The MBAB algorithm depends on branch and bound technique . Applied examples are used to show applicability of MBAB algorithm. The MBAB algorithm is compared with complete enumeration method (CEM). Conclusions are formulated on the performance of the (MBAB) algorithm .</p>			

MSc. Mathematics			
Time	Title	Student	Supervisor
	Solving Bi_harmonic Cauchy problem using a meshless collocation method	Baidaa khalil mostafa	Fatima Mohammed Aboud
<p>Abstract: In this article a fourth order differential boundary value problem is solved using a meshless collocation method proposed by Rasheed et al. and Nachaoui. The efficiency of the proposed methods is illustrated by solving problems for some examples for a polynomial and non polynomial exact solutions and by using CGM and CGLS algorithms and the numerical stability is verified by using a noise for the input boundary data</p>			
MSc. Mathematics			
Time	Title	Student	Supervisor
	Polynomial approximation of an inverse Cauchy Problem for modified Helmholtz Equations	Athraa Falih Hassan	Fatima Mohammed Aboud
<p>Abstract: In this paper, an inverse problem for the modified Helmholtz equation arising in heat conduction in the fin is considered. The goal of this paper is the determination of the temperature at the under-specified boundary (inner boundary of an annular domain) benefiting from the accessible part of the boundary with Cauchy data (boundary temperature and heat flux). This problem is solved numerically using the meshless method proposed in [2]. The stability is confirmed by applying a noise for the Cauchy data</p>			

MSc. Geology			
Time	Title	Student	Supervisor
	Hartha Reservoir Quality in East Baghdad Oilfield, Iraq: An Overview and Accurate Prediction	Afnan Munther	Abdul Reda Muhammad Sahab
<p>Abstract:</p> <p>The Hartha Formation, located in the East Baghdad oilfield of Baghdad governorate, was analyzed. The formation primarily contains porous limestone, high porosity limestone, compacted limestone, and small amounts of shaly limestone throughout all the wells studied (EB1, EB3, EB5, EB6, and EB7). The upper contact of the formation is conformable with the Tayarat Formation, while the lower contact is unconformable with the Saadi Formation. Based on well logs, the selected well was divided into three reservoir units (unit A, unit B, and unit C) that were further split into three insulating units (Barr 1, Barr 2, and Barr 3) and a cap rock unit (CRU). All wells analyzed exhibited good porosity values, with the best reservoir unit being unit C due to its high porosity values that exceed 25% and its abundance of movable oils. The EB1 well had the best reservoir quality overall, with unit A, unit B, and unit C all exhibiting high porosity values exceeding 25%, and all reservoir units containing movable oil.</p>			

Ph.D Physics			
Time	Title	Student	Supervisor
	A study of structural and chemical properties of $Ni_{1-x}Zn_xFe_2O_4$ ferrite powder prepared by co-precipitation method	Ruaa R. Ahmed	Tahseen H. Mubarak
<p>Abstract: Nickel zinc nanoferrites ($Ni_{1-x}Zn_xFe_2O_4$ with x ranging from 0.3 to 0.7 and 0.9) were employed in this study. Chemical co-precipitation was used to synthesize nanoparticles, X-ray diffraction, fourier transform infrared spectroscopy, field emission scanning electron microscopy analysis (FESEM), and the vibration sample magnetometer were used to determine the structure, size, morphology, and magnetic properties of nanostructures (VSM). X-ray diffraction was used to identify the crystalline phases, and all samples have cubic spinel ferrites. To evaluate particle sizes using Scherrer's formula. average crystallite sizes were in the range of (13-19)nm and FTIR spectroscopy data for respective sites were examined in the range of 200–4000 cm^{-1}. Between 320 and 1000 cm^{-1}, the formation of ferrite phase was confirmed, indicating the sample's ferrite nature. Tetrahedral complexes were assigned to the higher frequency band ν_1, while octahedral complexes were assigned to the lower frequency band ν_2. The M-H curve shows that M_s rises from 1.96-23.7 (emu/g).</p>			
Ph.D Physics			
Time	Title	Student	Supervisor
	Fabrication of some Quaternary Spinel Structure Electrodes for Photoelectrochemical Applications	Abdulsalam Mahmood Hasan	Ziad Tariq Khodair
<p>Abstract: In this study, nanostructured $ZnNiCo_2O_4$ and $MnNiCo_2O_4$ electrodes were fabricated by spray pyrolysis method and annealed at 550oC for 2 h. The structural, optical, and Photoelectrochemical properties were studied. The structural properties were examined using X-ray diffraction (XRD). The results show that the samples have cubic spinel structure. The atomic percentage determined by (EDX) and the thickness (cross section) of films measured by (FE-SEM), as well as the surface roughness measured through (AFM) are all used for analysis. The optical properties were investigated by UV-visible spectrophotometer, the energy band gaps of $ZnNiCo_2O_4$ and $MnNiCo_2O_4$ were estimated to be approximately 2.2 and 2.4 eV</p>			

respectively. The photoelectrochemical, comprising of photocurrent density, linear sweep voltammograms (LSV) and Mott-Schottky (MS), displayed flat band values of (1.5 eV and -0.55 eV) Vs NHE for ZnNiCo₂O₄ and MnNiCo₂O₄ respectively, where the conduction band and valance band values of ZnNiCo₂O₄ were (C. B= -0.6 eV and V.B= 1.6 eV), while those of MnNiCo₂O₄ were (C.B= -0.65 eV and V.B= 1.75 eV). The corresponding photocurrent densities for ZnNiCo₂O₄ and MnNiCo₂O₄ were 35 μ A/cm² and 50 μ A/cm², respectively. The electrodes were comprehensively studied for ZnNiCo₂O₄ and MnNiCo₂O₄ under a neutral water condition.



لتجليد الرسائل
والمطبوعات التجارية والجامعية

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