



المجاميع البحثية المعتمدة بجامعة تبوك

جدول المحتويات

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خارطة طريق مرحلية لمستهدفات الجامعات البحثية المعتمدة
لمدة ثلاثة سنوات للوصول لمنتج

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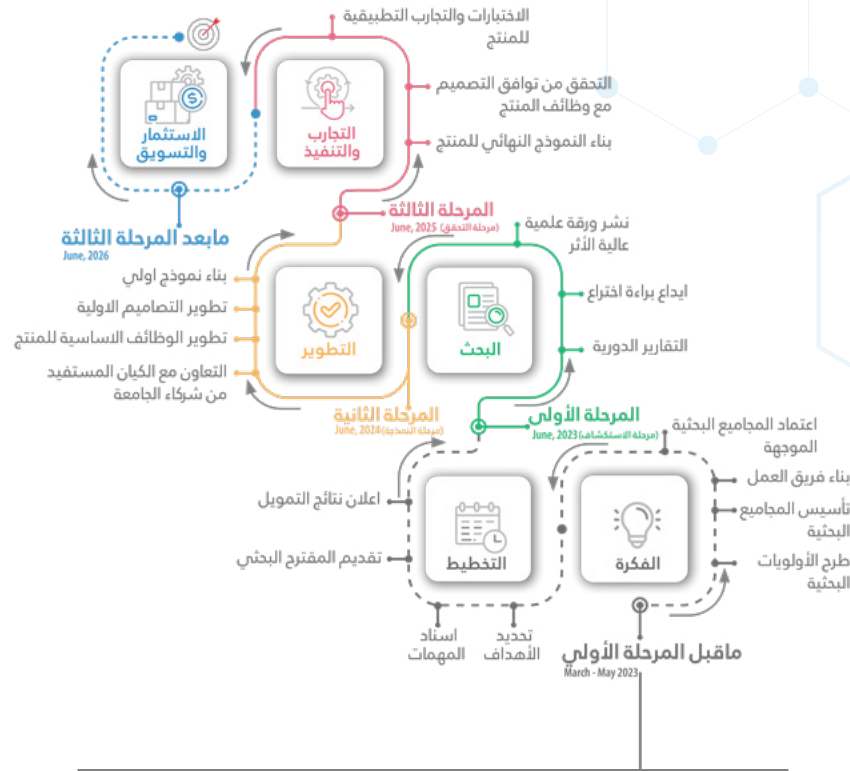
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المقدمة

إيماناً من عمادة البحث العلمي بضرورة مواكبة التحديات المستقبلية وتوفير بيئة جاذبة ومحفزة تدعم التميز البحثي والابتكار للمساهمة في بناء اقتصاد المعرفة من خلال توجيه البحث العلمي ليكون مرحلي ومستدام بما يخدم الهوية البحثية للجامعة المنبثقة من الأولويات الوطنية ومشاريع المنطقة التنموية ليسهم في تحويل الأبحاث النوعية إلى منتجات ذات جدوى اقتصادية، ويعزز فرص الاستثمار مع شركاء الجامعة والكيانات المستفيدة من القطاعات الحكومية والخاصة.

ولتحقيق تلك التطلعات ومستهدفات الجامعة في البحث والابتكار، ولضمان استدامة المشاريع البحثية بالجامعة من خلال وضع خطة بحثية لمدة ثلاثة سنوات لكل مجموعة بحثية لتضمن الوصول لمنتج تطبيقي نوعي، **لذا يسر العمادة أن تعلن عن المجاميع البحثية الموجهة المعتمدة بجامعة تبوك.**

خارطة طريق مرحلية لمستهدفات الجامعات البحثية المعتمدة لمدة ثلاثة سنوات للوصول لمنتج



قائمة المجموعات البحثية المعتمدة بجامعة تبوك

Research group name	Principle investigator	الكلية	رئيس المجموعة	اسم المجموعة	
Phytomedicine and mental health group	Dr. Amnah Al-harbi	العلوم	د. آمنه الحربي	مجموعة طب النبات والصحة العقلية	1
Microbial Diversity and Genomics Group	Dr. Amenah Alotaibi	العلوم	د. أمينة العتيبي	مجموعة التنوع الميكروبي والجينومات	2
Natural anticancer drug discovery and development from natural source	Dr. Uzma Faridi	العلوم	د. أوزما فريدي	اكتشاف الأدوية الطبيعية المضادة للسرطان وتطويرها من مصادر طبيعية	3
Nutrition Studies Research Group (NSRG)	Dr. Eman Alamri	العلوم	د. إيمان العمري	مجموعة أبحاث دراسات في التغذية	4
Hydrogen Energy Research	Dr. Asma Alturki	العلوم	د. أسماء التركي	بحوث طاقة الهيدروجين	5
Wastewaters Treatment from Hazards organic pollutants	Dr. Hatem Ahmed	العلوم	د. حاتم احمد	معالجة مياه الصرف من الملوثات العضوية الخطرة	6
Phytocompounds-based nanomaterials for combating infectious microbial pathogens	Dr. Haddad Elrabey	العلوم	د. حداد الربيعي	المواد النانوية القائمة على المركبات النباتية لمكافحة مسببات الأمراض الجرثومية المعدية	7
Production of attractive materials based on solid waste (for industrial and biomedical applications)	Dr. Dalia El-Sawy	العلوم	د. داليا الصاوي	إنتاج مواد جذابة تعتمد على النفايات الصلبة (للتطبيقات الصناعية والطبية الحيوية)	8
Energy storage green and suitability for energy storage	Dr. Raedah Alatawi	العلوم	د. رائده العطوي	تخزين الطاقة الخضراء وصلاحياتها لتخزين الطاقة	9
Particle Physics and its Applications Group (PPAG)	Dr. Rachid Ayad	العلوم	د. رشيد عياد	مجموعة فيزياء الجسيمات وتطبيقاتها	10
Cancer Research Innovation Group	Dr. Salma Alrdahhe	العلوم	د. سلمى الرداحي	مجموعة ابتكار أبحاث السرطان	11
Nano-Biosensor technology for Pesticide Detection in food	Dr. Saloua Helali	العلوم	د. سلوى الهلالي	تقنية Nano-Biosensor للكشف عن المبيدات الحشرية في الغذاء	12
Nano AgriTech & Environmental Sensors	Dr. Syed Khasim	العلوم	د. سيد قاسم	تقنية النانو الزراعية وأجهزة الاستشعار البيئية	13

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Plant Diversity and Conservation Group	Dr. Zahid Siddiqui	العلوم	د. زاهد صديقي	مجموعة التنوع النباتي والمحافظة عليها	15
Medical biochemistry	Dr. Imadeldin Elfaki	العلوم	د. عماد الدين الفكي	مجموعة الكيمياء الحيوية الطبية	16
Physical biochemistry research group	Dr. Fahad Al-rabae	العلوم	د. فهد الرباعي	مجموعة أبحاث الكيمياء الحيوية الفيزيائية	17
Smart nano food packing	Dr. Faud Alatawi	العلوم	د. فؤاد العطوي	مجموعة تغليف المواد الغذائية الذكي بتقنية النانو	18
Chemistry in the sustainability of Environment and Agriculture	Dr. Mohammed Alahmdi	العلوم	د. محمد الأحمدى	الكيمياء في استدامة البيئة والزراعة	19
Water purification research and technology	Dr. Mohamed Rashad	العلوم	د. محمد رشاد	بحوث وتكنولوجيا تنقية المياه، خطط معالجة مياه الصرف الصحي إعادة استخدام الحمأة	20
Waste water treatment plans sludge reuse					
Bimolecular interactions group- Protein ligand interaction and aggregation in health and disease	Dr. Mohammad Rehan	العلوم	د. محمد ريجان	مجموعة التفاعلات ثنائية الجزيئات - تفاعل البروتين الرابط والتجمع في الصحة والمرض	21
Research on the field of wastewater treatment and sustainable management of water resources	Dr. Mohamed Sobhi	العلوم	د. محمد صبحي	مجموعة معالجة مياه الصرف الصحي والإدارة المستدامة لموارد المياه	22
Cancer and Biomedicine	Dr. Mahmoud Abdelaziz	العلوم	د. محمود عبدالعزيز	السرطان والطب الحيوي	23
Ecology of Red Sea	Dr. Madeha Ghobashy	العلوم	د. مديحة غباشي	بيئة البحر الأحمر	24
energy storage solutions: biochar-based energy storage solution	Dr. Marwah Alsherif	العلوم	د. مروه الشريف	حلول تخزين الطاقة: حل تخزين الطاقة القائم على الفحم الحيوي	25

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Integrated Pest Management Research Group	Dr. Mo'awia Hassan	العلوم	د. معاوية حسن	بحوث الإدارة المتكاملة للآفات	26
Eco- friendly and sustainable infrastructure	Dr. Mona Albala-wi	العلوم	د. منى البلوي	مجموعة البنية التحتية الصديقة للبيئة والمستدامة	27
Tissue regeneration	Dr. Menier Alana-zi	العلوم	د. منير العنزي	تجديد الأنسجة	28
Recycling natural and synthetic (industrials) waste to Smart Materials	Dr. Nadia Hussein	العلوم	د. نادية حسين	إعادة تدوير المخلفات الطبيعية والاصطناعية (الصناعية) لتحويلها إلى مواد ذكية	29
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Waste to energy and carbon dioxide emission reduction	Dr. Nada Alatawi	العلوم	د. ندى العطوي	تحويل النفايات إلى طاقة وتقليل انبعاثات ثاني أكسيد الكربون	31
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Green energy	Dr. Hanadi Al-mukhlifi	العلوم	د. هنادي المخلفي	الطاقة الخضراء	33
Medicinal Chemistry and Drug Discovery Research Group	Dr. Humaira Parveen	العلوم	د. هاميرا بارفين	مجموعة أبحاث الكيمياء الطبية واكتشاف الأدوية	34
The research group of modern mathematical models of communicable and non-communicable diseases	Dr. Weam G. Alharbi	العلوم	د. وئام الحربي	المجموعة البحثية للنماذج الرياضية الحديثة للأمراض المعدية وغير المعدية	35
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IoT and Transportation Traffic management Group	Dr. MohamedAlwakeel	الحاسبات وتقنية المعلومات	د. محمد الوكيل	مجموعة إدارة حركة مرور النقل وإنترنت الأشياء	37
Intelligent Autonomous Systems Research Group	Dr. Saleh Albelwi	الحاسبات وتقنية المعلومات	د. صالح البلوي	مجموعة أبحاث الأنظمة الذاتية الذكية	38

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The Internet of Things (IoT)	Dr. Adel R. Al-harbi	الحاسبات وتقنية المعلومات	د. عادل الحربي	إنترنت الأشياء (IoT)	39
Future Economics: Identity Security in Cyberspace using AI based Multimedia Forensics	Dr. Lubna Alharbi	الحاسبات وتقنية المعلومات	د. لبنى الحربي	الاقتصاد المستقبلي: تأمين الهوية في الفضاء السيبراني باستخدام التحقيقات الرقمية في الوسائط المتعددة والمبنية على الذكاء الصناعي	40
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Federated Learning based Human Blood Glucose Level Estimation via Non-Invasive Data	Dr. Narmatha Chellamani	الحاسبات وتقنية المعلومات	د. نارماتا شلماني	التعلم الموحد القائم على تقدير مستوى الجلوكوز في الدم البشري من خلال البيانات غير الغازية	42
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Cyber Security Research Group	Dr. Amer Aljaedi	الحاسبات وتقنية المعلومات	د. عامر الجعدي	مجموعة أبحاث الأمن السيبراني	45
Environmental Information Systems Research Group	Dr. Ashraf M. Marei	الحاسبات وتقنية المعلومات	د. اشرف مرعي	مجموعة أبحاث نظم المعلومات البيئية	46
Proactive Risk Management through Improved Cyber Situational Awareness	Dr. Majed Aborokbah	الحاسبات وتقنية المعلومات	د. ماجد أبوركبه	إدارة استباقية للمخاطر من خلال تحسين الوعي بالحالة السيبرانية	47
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Identity Security in Cyberspace	Dr. Wahid Rajeh	الحاسبات وتقنية المعلومات	د. وحيد راجح	أمن الهوية في الفضاء السيبراني	49
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Advanced Power Electronics and Power Planning for Renewable Energy Systems	Dr. Saeed Alzahrani	كلية الهندسة	د. سعيد الزهراني	إلكترونيات الطاقة المتقدمة وتخطيط الطاقة لأنظمة الطاقة المتجددة	51
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Hematological malignancies and genomic medicine group	Dr. Mohammed Alasseiri	كلية العلوم الطبية التطبيقية	د. محمد العسيري	مجموعة الأورام الدموية الخبيثة والطب الجيني	61
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Fin-tech Research Group	Dr. Imdadullah Hidayat ur-Rehman	كلية إدارة الأعمال	د. إمداد الله هداية الرحمن	مجموعة أبحاث التكنولوجيا المالية	63

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Geriatrics and palliative medicine research group	Dr. Afaf Abdullah Albalawi	كلية الطب	د. عفاف عبدالله البلوي	مجموعة أبحاث طب الشيخوخة والطب التلطيفي	72

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Application of Nano-technology for Treat- ing Neurodegenera- tive Diseases Group	Dr. Abdullah Alattar	الصيدلة	د. عبدالله العطار	مجموعة تطبيق تقنية النانو لعلاج الأمراض العصبية التنكسية	73
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A mathematical analy- sis of Epidemic mod- els by using fractional calculus	Dr. Mohamed Barakat	الكلية الجامعية بالوجه	د. محمد بركات	تحليل رياضي للنماذج الوبائية باستخدام حساب التفاضل والتكامل الكسري	83

Research group name	Principle investigator	الكلية	رئيس المجموعة	اسم المجموعة	
Developing new fluorosensor for the detection of PAHs in marine water	Dr. Sahr Alsher-ari	الكلية الجامعية بالوجه	د. سحر الشراري	تطوير جهاز استشعار فلور جديد للكشف عن الهيدروكربونات العطرية متعددة الحلقات في المياه البحرية	84
Environmental & Natural Products	Dr. Marzough Albalawi	الكلية الجامعية بالوجه	د. مرزوقة البلوي	المنتجات البيئية والطبيعية	85
Smart materials	Dr. Aisha Albalawi	الكلية الجامعية بحقل	د. عائشة البلوي	مجموعة المواد ذكية	86
Environmental Stress and Sustainable Crop Production Group	Dr. Mohammad Nasir Khan	الكلية الجامعية بحقل	د. محمد نصير خان	مجموعة الإجهاد البيئي وإنتاج المحاصيل المستدام	87
Eco-Friendly Plant Diseases Control Group	Dr. Khalaf M. Alhussaen	الكلية الجامعية بحقل	د. خلف الحسين	مجموعة مكافحة أمراض النبات الصديقة للبيئة	88
Crop Quality Improvement in Tabuk Region	Dr. Awatif Abdul-majeed	الكلية الجامعية بأملج	د. عواطف عبد المجيد	تحسين جودة المحاصيل بمنطقة تبوك	89

البيانات التفصيلية (الهوية والانشطة والأهداف البحثية) للمجاميع البحثية المعتمدة

أولاً: كلية العلوم

المجموعة (أ)

Phytomedicine and mental health group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Amnah Alharbi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Rehab Almasaabi Sanaa Almowallad Hanan Alatwi Reema Almotairi Yasmene Alanazi Sahar Khateeb 	أعضاء المجموعة من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Ana Rodriguez-Mateos 	أعضاء المجموعة من خارج الجامعة Group members from outside the university
This group focus on the role of diet and how its correlated to diseases specifically mental health disorders. It also, will investigate the role of the gut microbiome on the health benefits of phytochemicals, and the development of biomarkers of food intake using metabolomic approaches.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> To investigate the role of diet on mental health in young people in Saudi Arabia To investigate novel foods and phytochemicals widely consumed in Saudi Arabia that could have beneficial effects on mental health To identify novel biomarkers associated with mental health issues To investigate possible genetic correlation of microbiome distribution and mental health in Saudi population To foster scientific collaborations between UK and Saudi Arabia To help early career researchers in Saudi Arabia to establish themselves To increase the visibility of University of Tabuk and their researchers internationally To obtain patent for the novel biomarkers and genetic variants associated with mental health disorder in Saudi population. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> To explore the role of diet on the mental health of the young population in Saudi Arabia. Examine different biomarkers and their association to the gut-brain axis Investigate possible phytochemical rich diet, tailored to the Saudi population, in improving anxiety, depression and stress levels in young people. 	نشاط المجموعة Group activity

المجموعة (٢)

Microbial Diversity and Genomics Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Amenah Alotaibi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Dikhnah Alshehri Basmah Alharbi Hanaa Ghabban Asma Alenzi Doha Albalawi Khyreyah Alfifi Abeer Alkhaibari Abdulrahman Alsmari Madeha Ghobashhy Marfat Alatawy 	أعضاء المجموعة من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Eric J Schott 	أعضاء المجموعة من خارج الجامعة Group members from outside the university
<p>The Microbial Diversity and Genomics Group members are well versed in microbiology and biotechnological studies. This group studies the microbial population of Saudi Arabia particularly in the Tabuk region(Neom). The group will focus on the identification of a unique microbial population that has commercial potential. Currently, we are working on soil microbiota of different regions in Tabuk.</p>	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> To Identification of microbial diversity of KSA, especially Tabuk region. To create a digital backbone of sequences from the tree of life that will serve as critical infrastructure for biology, conservation, agriculture, medicine, and the growing global bioeconomy. To study the unique microbial flora with a potential of commercial application. Assessment of the microbes for biological control against infectious pathogens. Development of sustainable research capabilities for faculty members and postgraduate students in the field of microbial diversity and genomics studies. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Development of data of microbial diseases of plants and animals of Tabuk region. Study of microbial diseases of plants and animals and their mitigation with sustainable approaches Produce the alternative pesticides (bio-pesticides from microbes) to control insect pests and plant diseases. development of improved varieties of plants. Identification of novel genes from microbes. 	نشاط المجموعة Group activity

المجموعة (٣)

Natural anticancer drug discovery and development from natural source	اسم المجموعة Group Name
<ul style="list-style-type: none"> Uzma Faridi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammad Zubair 	أعضاء المجموعة من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Naseem ahmed M.P Darokar 	أعضاء المجموعة من خارج الجامعة Group members from outside the university
The present group has the combination of the experts of biochemistry, chemistry, medicine and pharmaceutical chemistry as the main purpose of this research group is to identify, derivatise and evaluate the anticancer and antioxidative properties of one of the potent anticancer agent from the natural sources.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> To find out novel anticancer molecule(s) from the natural sources (plants/seaweeds) To discover and develop molecule(s) with specific anticancer activity from sustainable source with minimum cost and side-effect To patent the most effective molecule(s) 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Identify a novel anticancer molecule from the natural source using in-vitro and in-vivo methods. Derivatise the parent molecule to obtain enhanced bioactivity of the molecule. Evaluate the toxicity of active molecules on normal cells (in-vivo/in-vitro). Study the mechanism of action of the most active mol/derivative (s) using advanced molecular biology related techniques. 	نشاط المجموعة Group activity

المجموعة (٤)

Nutrition Studies Research Group (NSRG)	اسم المجموعة Group Name
<ul style="list-style-type: none"> Eman Alamri 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Hala Mohamed Seham Almasoudi Nawal Ozaybi 	أعضاء المجموعة من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mamoun Muhammed Ghedeir Muslem Sukhail Alshammari Nora Abdullah Faris Alfaris Jozaa Zaidan Ali AlTamimi 	أعضاء المجموعة من خارج الجامعة Group members from outside the university
<p>Our research program focuses on producing optimized nanonutraceuticals to be dispersed in commercial foods and obtaining nanonutraceuticals-enriched functional bioactive foods which can be used for nutrient-related and promote the immunity, diseases, obesity and obesity-associated complications, and can be utilized to raise during pandemic such as COVID-19.</p>	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Design and developing optimized nanonutraceuticals-enriched foods for nutrient-related diseases. Drawing safe/nontoxic approaches. Developing novel nanonutraceuticals-encapsulated soluble dietary fibers for alleviating the obesity and obesity-associated complications. Nanonutraceuticals-induced bioactive foods for enhancing immunity in particular during pandemic such as COVID-19. Producing promising applied product of bioactive functional foods containing nanonutraceuticals with beneficial impact to build healthy society. Ensure the sustainability of the research program through the development of the capacities and capabilities of faculty members and postgraduate students in the field of Nutrition. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Extraction, purification and identification of nutraceuticals from their natural origin Synthesis of novel nanonutraceuticals and performing their characterizations study. Studying the stability of the developed nanonutraceuticals and their dispersibility in food products to produce functional bioactive food products Preparation of nanonutraceuticals-encapsulated soluble dietary fibers, physicochemical characterizations and encapsulation efficiency, release profile, biocompatibility and bioavailability Studying the effect of the developed nanonutraceuticals on obesity, obesity-associated complications immunity responses, Measuring the required parameters when nanonutraceuticals applied for obesity or immunity response. 	نشاط المجموعة Group activity

المجموعة (هـ)

Hydrogen Energy Research	اسم المجموعة Group Name
• Asma Alturki	رئيس المجموعة Principle investigator
• Ayshah Alatawi	أعضاء المجموعة من منسوبي الجامعة Group members from the university
• Abd El-Hady Kshyout • Kamel Shoueir	أعضاء المجموعة من خارج الجامعة Group members from outside the university
Energy and Industry	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> The neat product-based few-layered graphene will be a remarkable promoting criterion for hydrogen production. The full characterization of the newly developed metal-free graphene-carbon nitride layered nanojunctions and their postulated mechanism will be discussed. It is expected that the prepared novel FLG layered nanojunctions nanocomposites will be promising results for H₂ production under energy-saving solar light/visible-light irradiation and in environmental and energy storage applications matching the rules of "green chemistry." 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Provide new insights into novel approach, facile, efficient, and cost less preparative methods for designing metal free graphene-carbon nitride layered nanojunction. Improvement the optical physical, and electrical behaviors to solve environmental and energy storage issues by sustainable, green, and eco-friendly methods. The developed technique will be used for green hydrogen production under solar hydrogen generations. 	نشاط المجموعة Group activity

__ المجموعة (٦) __

Wastewaters Treatment from Hazards organic pollutants	اسم المجموعة Group Name
<ul style="list-style-type: none"> Hatem Ahmed Al-Aoh 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Nasser Alamrani Nadia Hussein Elsayed 	أعضاء المجموعة من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Abdul Halim Abdullah 	أعضاء المجموعة من خارج الجامعة Group members from outside the university
The program focuses on determining the type and quantity of the most dangerous organic compounds present in the various water sources, as well as determining the best treatment methods and their use in removing these pollutants from polluted water.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Determining the type and quantity of the most dangerous organic compounds present in the various water sources. Using the best and most recent treatment methods to remove pollutants from water. Transfer and localization of analysis and processing methods within the University of Tabuk. 	أهداف المجموعة Group goals
Develop qualitative and quantitative analysis methods used to determine the type and quantity of pollutants in water, creating a database of the most important organic pollutants present in the various water sources in the city of Tabuk, and developing different water treatment methods.	نشاط المجموعة Group activity

المجموعة (٧)

Phytocompounds-based nanomaterials for combating infectious microbial pathogens	اسم المجموعة Group Name
<ul style="list-style-type: none"> Haddad Elrabey 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Fahad Almutairi Adel Alalawy Mohammed ALDuais Mohammed Sakran Nahla ZIDAN 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Ahmed Tayel 	المشاركين من خارج الجامعة Group members from outside the university
The group focuses on the discovery and evaluation of phytocompounds and plant derivatives (e.g. extracts, polysaccharides, mucilage, essential oils, ...) from native species and their derived nanomaterials/nanocomposites (e.g. with biosynthesized nano-metals, nanopolymers, and liposomes) for generating potent bio-active microbicidal agents with minimal side-effects to constrain infectious pathogenic microorganisms (e.g. gastrointestinal, skin, and respiratory pathogens), particularly the antibiotic-resistant strains.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Exploration of native wild plant treasures as potential biocidal agents Application of nanobiotechnology approaches for enhancing antimicrobial bioactivities Promoting the innovation and creativity in the field of antimicrobial formulations Technology-transfer and localization for developing effectual antimicrobial nanomaterials Warrant the sustainability of research group through increasing the capacities/capabilities of faculty stuff, researchers, and postgraduates in the field of phytomedicine, natural therapeutics and antimicrobial formulations. The research activity will be mostly implemented at the University of Tabuk. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Collection, extraction and evaluation of natural phyto-derivatives from native plant species Fabrication of bioactive nanomaterials/nanocomposites using phyto-derivatives Construction and judging the antimicrobial potentiality of formulated phyto-based nanomaterials against microbial pathogens Emphasizing the antimicrobial modes of action of generated agents and their potential Applicabilities. 	نشاط المجموعة Group activity

المجموعة (٨)

Production of attractive materials based on solid waste (for industrial and biomedical applications)	اسم المجموعة Group Name
<ul style="list-style-type: none"> Dalia El-Sawy Abulyazied Hamouda 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Asma M. Alturki Abeer Maitary Ali Keshk Rabaa Bousbih Karma Albalawi Naifa Suleiman Al-Atawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Essam Bahgat Moustafa Ammar Elsheikh Monies A. Azooz Mohammed Abdel-Aziz Taha 	المشاركين من خارج الجامعة Group members from outside the university
The research program focuses on the management of solid waste generated from factories and workshops in order to obtain materials that have attractive physical, mechanical, and electrical properties, which make them suitable for use in various industrial applications. It is also interested in recycling solid animal waste such as camel bones to obtain materials with promising mechanical and biological properties for use in bio-medical applications as substitutes for bones and teeth.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Safe and effective disposal of solid waste from factories and workshops, which helps to preserve the environment and reduce pollution damage and benefit from it in obtaining alternative raw materials for expensive chemicals. The use of these wastes in the preparation of nanocomposites that have distinctive mechanical, tribological and electrical properties, which makes them usable in various industrial applications. Disposing of solid animal waste (camel bones) from the environment to reduce biological pollution resulting from the fermentation of these bones and the multiplication of bacteria causing diseases that threaten society. The use of this waste to obtain nanocomposites that have distinct biological and chemical properties which makes them suitable for use as alternative materials for bones and teeth. Developing the efficiency of the Faculty members of the research team in the field of solid waste recycling of all kinds. Publishing the results obtained in specialized international periodicals, which works to raise the university's classification and the possibility of scientific exchange between the University of Tabuk and other universities inside and outside the Kingdom. Attempting to obtain a product. Knowing that most of the experimental work will be done in University of Tabuk. 	أهداف المجموعة Group goals

Collecting various industrial wastes and using them as a cheap source of raw materials.

Adding some other materials, such as different types of ceramics, to these wastes after processing them to obtain composites with attractive properties.

Characterization and measurement of various properties of the obtained nanocomposites.

Collecting solid animal waste from slaughterhouses and processing them to obtain the important hydroxyapatite biomaterial.

Improving the biological and mechanical properties of hydroxyapatite by adding some other materials to it, which make it applicable in biomedical fields.

نشاط المجموعة
Group activity

— المجموعة (٩) —

Green and suitability for energy storage	اسم المجموعة Group Name
<ul style="list-style-type: none"> Raedah Alatawi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Ali Keshk Abeer Bukhari Aliyah Alhawiti Omar Alatawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Tawfik Khattab Hesah Alrashidi 	المشاركين من خارج الجامعة Group members from outside the university
Energy storage	الهوية البحثية للمجموعة Group identity
<p>Opens a new approach for designing simple supercapacitor devices in view of their powerful complexation abilities and efficiencies, together with further desirable characteristics for different applications using marine sources as a novel step for costless supercapacitors. It is envisioned that the research work of the current project will lead to green supercapacitor nano-composites with highly sophisticated applications in the energy applications.</p>	أهداف المجموعة Group goals
<p>Our research point will be a forward step for the industrial sector. The added value of the proposed research is less time and energy consumption for the supercapacitor applications, which will spread the knowledge of easy removal of wastes and open a new market of</p> <ul style="list-style-type: none"> variable incomes in society. Using of wastes to products. 	نشاط المجموعة Group activity

— المجموعة (١٠) —

(Particle Physics and its Applications Group (PPAG	اسم المجموعة Group Name
Rachid Ayad	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Nawal Alghamdi Kholoud Alnahdi Mansour Alatawi Ahmad Alatawi Fawaz Alhawiti 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Giovanni Bonvicini Roberto Bedogni Numa Althibity Alhussain Abuhoza 	المشاركين من خارج الجامعة Group members from outside the university
Environmental Technology	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Involve the university in the field of accelerator technologies, radiation detectors, medical physics and renewable energy, which are areas of innovation and creativity in line with the Saudi 2030 vision. Organize conferences and workshops to allow our researchers to discuss the latest findings about the group research topics. Publish our results in high rated scientific journals and attend international scientific conferences. Train Saudi young/emerging researchers, students, and technicians to be the future managers of the research group. Work on upgrading our particle physics Lab to become a re-search unit and then hopefully a research center. 	أهداف المجموعة Group goals

Our research group had been established with the beginning of the international collaboration with the KEK Center in Japan, as the University of Tabuk is member of the Belle experiment, at KEK center, in Japan, since 2011. The Belle experiment (1999-2010) at KEK Center, Japan, is an experiment that helped to explain the lack of anti-matter in the universe. The Belle experiment, that took data on the KEKB accelerator, was cited, in the 2008 Nobel Prize in Physics press conference report, as a major contributor to award three Japanese physicists this Nobel prize. The KEKB accelerator had been upgraded to the SuperKEKB accelerator with 40-times more Luminosity that required, also, the upgrade of the Belle experiment to the Belle II experiment. Our first years, since 2011, were dedicated to the Belle II experiment where we designed, commissioned, and installed two sub-detectors within the Belle II experiment. We published Belle and Belle II experiments results in about 180 papers, since 2011, in high rated Journals with Impact Factors up to 9. With the emergence of the Saudi 2030 vision we opened many others research areas with applications in medical physics, agriculture, and renewable energy. In the medical physics sector, we are collaborating with the King Faisal Specialist Hospital & Research Center (KFSHRC) at Riyadh mainly in the X-ray dosimetry within the KFSHRC Secondary Standards Dosimetry Laboratory (SSDL). One of our accomplishments is we installed a motorized system, tested at our Lab at Tabuk, to accelerate calibrating hospitals dosimeters

We won many institutional and strategic grants at the university of Tabuk level:

- We were funded to design and build a prototype to measure soil humidity using cosmic neutrons.
- We were as well funded to build a prototype to produce hydrogen powered by solar panels.

نشاط المجموعة Group activity

— المجموعة (II) —

Cancer Research Innovation Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Salma Alrdahe 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Abdullah Aldhafri Waseem Alzamzami Yasmene Alanazi Hanan Alatwi Aishah Albalawi Doaa Darwish 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Denise Jackson 	المشاركين من خارج الجامعة Group members from outside the university
<p>Our research program focuses on the developing of cancer research, which include causes, diagnosis ,and prevention. Our aim is to create Saudi database from children patients affected with Acute lymphoblastic leukemia (ALL) that corresponds to 25-35% of all pediatric cancers. The database will include the most common genes mutation that lead to the development of ALL in children, and to identify any inherited genes from parents.</p>	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Invent and develop the methodologies of cancer diagnosis and research. Promoting a culture of innovation and creativity in the field of cancer research Technology transfer and localization for cancer research by using targeted cancer panels and DNAsequencing. Ensure the sustainability of the research program through the development of the capacities and capabilities of faculty members and postgraduate students in cancer research innovations. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Develop a platform for the Acute lymphoblastic leukemia (ALL) database from the Saudi population by using DNA sequencing and targeted DNA Panels. Comparing the Saudi ALL database with the international database to identify any novel mutations and the potential target therapy from similar cases worldwide -.Identifying and exploring gene expression profiling and protein profiling for the genes that were identified from DNA sequencing data. Perform bioinformatics analysis to identify novel mutated genes that contribute to the prognosis and development of ALL, signaling pathways involved, upstream regulators and downstream target genes. 	نشاط المجموعة Group activity

المجموعة (١٢)

Nano-Biosensor technology for Pesticide Detection in food	اسم المجموعة Group Name
<ul style="list-style-type: none"> Saloua Helali 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Eman Fathy Monia Youssef oueder Dalia kamal alnagar Suhair Abdallah 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Abdelghani adnane Albandari Alrowaily 	المشاركين من خارج الجامعة Group members from outside the university
<ul style="list-style-type: none"> To guarantee the safety of consumer food, biosensors offer an easy ,affordable, and reliable technique to find pesticides in food matrices. Several recent studies with biosensors linked to analytical performance are described in this literature review, in addition to the nanomaterials biorecognition materials and transduction techniques. The nanomaterials are attractive for high-performance biosensors due totheir unique properties, such as high specific surface areas, high electrons mobilities, and exceptionally low electronic noise. A variety of biomolecules have been used as basic detection elements for detecting pesticides in food. 	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Develop a new strategy for the rapid detection of selected pesticides. The sensing areas will be functionalized using nanomaterial which are highly specific to heavy ions. Choose the best biomembrane electrode interface disc for electrode fabrication based on the maximum response signal output current generated. Create a biosensor prototype device for the detection of pesticides in food. 	أهداف المجموعة Group goals

- Looking for the best strategy for immobilization of nanomaterial.
- The alteration of the interface properties was studied by several.
- techniques such as electrochemical impedance spectroscopy (EIS) ,
- cyclic voltammeter, X-ray diffraction (XRD), scanning electron
- microscopy (SEM), and Fourier transform infrared (FTIR).
- The structure characterization of biosensors and pesticides detection will be do in tabuk university.
- Determination the effectiveness of nanomaterial for adsorption pesticide on its surface, with different interaction time
- Studying of the functionalized gold electrode with different concentrations for adsorption pesticide

نشاط المجموعة
Group activity

المجموعة (١٣)

Nano AgriTech & Environmental Sensors :(NAES-Research Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Syed Khasim 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammad Shahata Shams M Issa Panneerselvam Chellasamy Mohammad Al-Ahamdi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Syed Ghulam Dastager Basavaraj Angadi Ziaul Haq Khan 	المشاركين من خارج الجامعة Group members from outside the university
<p>This research group consists of distinguished researchers from UTand outside Kingdom who have vast expertise in dealing with variety of functional nanomaterials for technological applications, in particular nanomaterials for sustainable environment and agricultural practices. Our research activities focus on development of novel nanomaterials and functional nanomaterials from traditional chemical synthesis and advanced green chemistry methods. We focus on fabrication of nanodevices and structures for technological applications such as optoelectronics, energy and environmental monitoring in addition to using nanotechnology for smart agricultural practices.</p>	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Synthesis of novel Nanomaterials and FunctionalNanomaterials through chemical and green synthesis techniques. Fabrication of Nano materials-based devices for technological applications. Development of Nano biosensors for Environmental monitoring (such as gas, humidity, soil moisture, pH and temperature etc), Utilization of Nano biosensors for smart agricultural practices (like biosensors for fertilizers and pesticides monitoring) to enhance the crop yield. Monitoring the plant health and physiology by fabricating modern smart sensors, Developing prototypes technology, technology transfer between industrial partners. 	أهداف المجموعة Group goals

Identifying suitable advanced nanomaterials and synthesizing them through biomass. Designing high performance nanocomposites using biomass derived nanoparticle, Characterizing the obtained nanocomposites using analytical techniques to understand structural features. Fabrication of Nano Biosensors through spin coating/drop casting and etching techniques using nanocomposites for environmental monitoring (such as Greenhouse gases humidity, soil moisture, pH, temperature and toxic volatile organic compounds, Optimization of Environmental sensors and integrating them with IoT Using the fabricated Nano Biosensors for smart agricultural practices (such as monitoring plant health and plant physiology, Development of smart sensors for pesticides and fertilizer monitoring to facilitate smart agricultural practices in Kingdom Commercial prototypes and technology transfer patent).

نشاط المجموعة
Group activity

المجموعة (١٤)

Research in Renewable Energy Storage Solutions	اسم المجموعة Group Name
<ul style="list-style-type: none"> Saleh Alghamdi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Nacer Badi Hatem Al-Aoh 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Alex Ignatiev Ahmad Alzahrani 	المشاركين من خارج الجامعة Group members from outside the university
The research group understands and develops the fundamental properties of renewable energy materials, create new applications based on these materials, and disseminate the fundamental and applied knowledge through education, outreach, and technology transfer.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Studying and developing the basic characteristics of renewable energy storage materials and creating new applications that depend mainly on these materials. Harnessing nanoscale materials and compounds to serve renewable energy storage materials and systems. Focusing on cutting-edge research and development with the aim of advancing renewable energy storage science and technology Providing innovative solutions to difficult problems in the sciences of renewable energy storage materials to serve marketing and promote economic growth for society. 	أهداف المجموعة Group goals
<p>The research activities of the Renewable Energy Storage Solutions Group include:</p> <ol style="list-style-type: none"> 1. Electric energy storage components such as supercapacitors and batteries. 2. Hydrogen energy storage materials and technologies for fuel cell applications. 3. Energy storage solutions for Building Integrated Photovoltaics (BIPV). 	نشاط المجموعة Group activity

— المجموعة (١٥) —

Plant Diversity and Conservation Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Zahid Siddiqui 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Zahid Abbas Dhafer Albakre 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Khalid Hakeem Mather Ali Khan Salim Khan 	المشاركين من خارج الجامعة Group members from outside the university
<p>The group members are well versed in plant science and biotechnological studies to study the plant and their interaction with the environmental conditions. The group will focus on the conservation of endemic and endangered plants of Tabuk as well as KSA. Beside that the group will work on the identification of novel plants of economic importance (medicinal and aromatic plants) from the Tabuk region, as well as developing new protocols for their propagation and conservation. Currently, we are working on the conservation of endangered plant. <i>Moringa oliefera</i> as well as identification of viruses infecting <i>Catharanthus</i> sp. an important anticancerous plant.</p>	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Identification of endemic, endangered and rare plant of KSA especially Tabuk region. Study of the interaction of plant and environment in ecological and environmental perspectives as well as for biological control. Strategic evaluation for ecosystem restoration and afforestation by means of plant biotechnology. Strategic expansion of research capabilities for faculty members and postgraduate students in the field of plant diversity and conservation. 	أهداف المجموعة Group goals

- Development of data of plant diversity of Tabuk region.
- Development of protocols for native economically important, endemic and endangered plants that need conservation by means plant biotechnology.
- Study of the soil and its effects in important cash crop and their mitigation.
- Development of improved varieties of plants that sustain different types of stress.
- Study of the reuse of treated water and sludge for irrigation and fertilizer of crops and landscaping.
- Development of micropropagation protocols, synthetic seeds, somatic embryos, somaclonal variant for ecosystem restoration and afforestation.

نشاط المجموعة
Group activity

— المجموعة (١٦) —

Medical biochemistry	اسم المجموعة Group Name
<ul style="list-style-type: none"> Imadeldin Elfaki 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Rashid Mir Hyder mirghani Rehab Almasaabi sanaa Almowallad 	المشاركين من منسوبي الجامعة Group members from the university
Mohamed Zaiou	المشاركين من خارج الجامعة Group members from outside the university
Identification of the genes that are associated with genetic diseases such metabolic syndrome diabetes, cardiovascular disease in Tabuk population.	الهوية البحثية للمجموعة Group identity
Identification of the loci that are associated with metabolic syndrome in Tabuk region	أهداف المجموعة Group goals
Biochemistry - molecular biology - genome wide association studies - Allele specific PCR and cardiovascular disease	نشاط المجموعة Group activity

— المجموعة (IV) —

Physical biochemistry research group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Fahad Alrabae 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammad Khan 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Stephen E Harding Rizwan Hasan Khan 	المشاركين من خارج الجامعة Group members from outside the university
We have the capacity and capability to organize scientific research work at university of Tabuk and We have the laboratory and existing physical laboratory space to work and publish quality work to increase the scientific standard of the university locally and globally. We ensure to work according to university vision and mission to enhance the quality of research activity in university campus so that the level of education and research can rise nationally and globally.	الهوية البحثية للمجموعة Group identity
Work continuously to build the capacity and capability to organize scientific research work at university of Tabuk. We have existing physical laboratory space to work and publish quality work to increase the scientific standard of the university locally and globally.	أهداف المجموعة Group goals
<ul style="list-style-type: none"> To collaborate and exchange ideas with peer group and work hard to generate new knowledge. Understanding molecular events and processes to utilize the knowledge in developing useful resources. 	نشاط المجموعة Group activity

المجموعة (١٨)

Smart nano food packing	اسم المجموعة Group Name
<ul style="list-style-type: none"> Faud Alatawi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sael Musallam Alatawi Mohamed Sakran Doaa Darwish Nahla Salah Zidan 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mehrez E El-Naggar 	المشاركين من خارج الجامعة Group members from outside the university
Smart nano fiber for edible coating	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> For the first time, the remarkable magnetic nanoparticles promoted new ideas for intelligent food packing. Provide efficient, cheap, facile, preparative methods for fabricating green nanofibers as a new green generation of food packing membrane. Synthesizing a new generation of nanofibers that will be promising results for Magnetic nanoparticles will be encapsulated inside PU nanofibers and preserve qualitative attributes of food preservation for up to 40 days. Publication in high impact factor (Q1) top ten of WOS Applicable product (mass scale production for intelligent packing based on magnetic nano fiber for the first time in kingdom of Saudi arabia Patent registration (if possible depend on funding). 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Fabricating of novel smart nano packing, which can provide relatively abundant nanofibers enhanced long life for food during preservation. Reduce cost. Enhancement features such as gumminess, hardness, cohesiveness storage time, and adhesiveness characteristics throughout the storage period lend credence to the idea that MNPs-enrolled nanofibers could be employed for active food packaging in the future. Published the obtained results in a high-impact journal. 	نشاط المجموعة Group activity

— المجموعة (١٩) —

Chemistry in the sustainability of Environment and Agriculture	اسم المجموعة Group Name
Mohammed Alahmdi	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sayeed Mukhtar ALBAKRE DHAFER ALI Amal Mogharbel Humaira Parveen Farj Alanazi Saudi alzhvani 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Naseem Ahmed 	المشاركين من خارج الجامعة Group members from outside the university
The group produces commercial and environmental products using chemical catalysts and natural materials to promote environmental and agricultural sustainability.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Bio-waste and other waste can be converted into commercial products by inventing various effective methods. Increasing the effectiveness of secondary materials in agricultural production by preparing them. Enhancing the research competence of research students 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Product development of eco-raw materials for cosmetics, pharmaceuticals, and food It is developing products made from natural materials with a high water absorption rate and rich in minerals to increase agricultural efficiency. 	نشاط المجموعة Group activity

المجموعة (٢٠)

Water purification research and technology Waste water treatment plans sludge reuse	اسم المجموعة Group Name
Mohamed Rashad	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> • Kholoud Alnahdi • Shams Issa • Meshari M Aljohani • Dalia El-Sawy. Abulyazied • Saloua Mohamed Helali • Naifa Atawi • Duna A.K. Alenazi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> • Ahmed F. M. EL-Mahdy • Hesham Mahmoud Mohamed • Mohammad Aslam 	المشاركين من خارج الجامعة Group members from outside the university
<p>Wastewater is known to be contaminated with hazardous organic dyes, inorganic dyes, and heavy metals. These pollutants have a harmful effect on humans and animals as well, so water purification is one of the important challenges of Saudi Arabia's Vision 2030, so we are working on more progress in the production of nanomaterials that are useful in water purification. With this vision, it is evident that the proposed project design and development of both organic and inorganic nanoparticles using nanotechnology to enhance their water purification efficiency in accordance with Saudi Arabia's Vision 2030. This raises water savings in the Kingdom. Therefore, the research team seeks to be an effective team in achieving the desired vision of the Kingdom in developing the water sector by increasing the Kingdom's share of the water available in all regions of the Kingdom of Saudi Arabia.</p>	الهوية البحثية للمجموعة Group identity

The goal of this research group is to remove pollutants from water for reuse in agriculture and industry. There are some nanomaterials that help remove some of these pollutants, such as metal oxides. The choosing the suitable of nanomaterials is our interest as a catalyst for the removal of these pollutants by ultraviolet radiation. Size and shapes are important factors affecting water purification efficiency. Study the effect of absorption concentration, absorption time and pH solution on absorption performance by UV radiation.

Comparing measurements of these effects among nanoparticle catalysts in developing water purification technologies. Therefore, according to our previous studies, we can fabricate a filter for filtration of wastewater from textile factories to remove dyes from the discharge of these factories by using several types of nanomaterials.

أهداف المجموعة Group goals

- Developing nanomaterials that help remove some of these pollutants.
- Developing filters for filtration of waste water from textile mills.
- Study several related pollutants to learn how to avoid and remove them.
- Develop new materials to help remove the total number of contaminants in a single filter.

نشاط المجموعة Group activity

المجموعة (٢١)

Bimolecular interactions group- Protein ligand interaction and aggregation in health and disease	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammad Rehan Khan 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Syed Khalid Mustafa Mohammad Dilshad 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Rizwan Hasan Khan Taza Gul Safi 	المشاركين من خارج الجامعة Group members from outside the university
We have the capacity and capability to organize scientific research work related to aggregation of protein. Aggregation of protein affects human population in many ways. At university of Tabuk we have the basic laboratory and existing physical laboratory space to work and publish quality work in this area of research; this will be beneficial to increase the scientific standard of the university locally and globally. We ensure to work according to university vision and mission to enhance the quality of research activity in university campus so that the level of education and research can rise nationally and globally	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Work continuously to build the capacity and capability to organize scientific research work at university of Tabuk. We have existing physical laboratory space to work and publish quality work to increase the scientific standard of the university locally and globally. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> To collaborate and exchange ideas with peer group and work hard to generate new knowledge. Understanding molecular events and processes to utilize the knowledge in developing useful resources. 	نشاط المجموعة Group activity

المجموعة (٢٢)

Research on the field of wastewater treatment and sustainable : management of water resources	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohamed Sobhi awad 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mahmoud Abdelaziz Elsiddig Idriss Mohamed Maia Abdelaziz Ibrahim Abdullah Al grfan 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mostafa Nassar 	المشاركين من خارج الجامعة Group members from outside the university
The program focuses on the synthesis of compounds with innovative methods suitable for wastewater treatment and a means for sustainable management of water resources.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Synthesis of compounds with effective and safe specifications in the field of wastewater treatment. Evaluation of laboratory-synthesized compounds in terms of efficiency and effectiveness in wastewater treatment and the sustainability of water resources. 	أهداف المجموعة Group goals
<p>Development and innovation of some promising synthesized compounds in wastewater treatment.</p> <p>Exploring modern and safe methods in the preparation of compounds involved in the wastewater treatment and for sustainable management of water resources.</p>	نشاط المجموعة Group activity

المجموعة (٢٣)

Cancer and Biomedicine	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mahmoud A Abdelaziz 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> ADEL IBRAHIMALALAWY Mohamed Sobhi awad Omayma Alesawe Elsiddig Idriss Mohamed Maia Abdelaziz Ibrahim Abdullah Al-grfan Maryam Alshehri Omar Alatawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Rafat Milad Mohareb 	المشاركين من خارج الجامعة Group members from outside the university
The program focuses on developing a research view of the concept of treating cancerous diseases using advanced chemotherapy	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Innovation and development of safe therapeutic methods to treat cancerous tumors. Synthesis of new heterocyclic organic compounds to stop and destroy various cancer cells. New innovative anti-cancer compounds are the nucleus for further research in this field in the future. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Development and innovation of some promising organic compounds in the treatment of breast, colon and bladder cancers. Exploring modern and safe methods in the preparation of compounds involved in the treatment of cancer. Exploration of natural substances in their origin as antibiotics for the treatment of various cancer tumors by using magnetic nanoparticles (MNPs) techniques. 	نشاط المجموعة Group activity

— المجموعة (٢٤) —

Ecology of Red Sea	اسم المجموعة Group Name
<ul style="list-style-type: none"> Madeha Othman Ghobashy 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Basmah Alharbi Dikhnah Saeed Alshehri Marfat Alatawy Fuad Alatawi Hanaa Ghabban Asma Alenzi Doha Albalawi Amenah Alotaibi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Abdelazeem Mohamed Algammal 	المشاركين من خارج الجامعة Group members from outside the university
<p>This research team is focusing on enhancing coral reef resilience using environmentally friendly strategies. They will investigate how coral communities are distributed throughout the Red Sea's shoreline, how environmental pressures impact corals distribution, how coral bleaching is caused by environmental stresses, and how they might restore coral health. Also, they'll investigate if adding microalgae and bacteria to a coral reef as part of a "microbial consortium" might enhance coral fitness.</p>	الهوية البحثية للمجموعة Group identity
<p>1-Sustaining Red Sea natural resource utilization and conservation in support of the of the Kingdom's goals for growth and economic diversification.</p> <p>2- Developing a thorough grasp of the diverse ecosystem of the Red Sea.</p> <p>3- Researching how pollution reduction, habitat resilience, and other stresses influence life in the Red Sea.</p> <p>4-Developing of new enabling technologies to increase the sustainability of interactions between human and sea.</p> <p>5-Conservation of coral reefs and other critical coastal habitats, such as mangrove stands and seagrass meadows.</p>	أهداف المجموعة Group goals

- Studying the environment of the Red Sea and the conditions that threaten the environment and cause stress. , Studying the types of coral reefs endemic in the Red Sea
- Studying the effect of environmental stress on the distributions of coral reefs in the Red Sea -Studying the impact of climatic changes on the environment of the Red Sea and its endemic marine organisms. -Assessing the effect of environmental stress pollution and global warming, changing salinity and acidity of water on marine algae in the Red Sea.,Studying the distributions of marine algae along the Red Sea coast., Monitoring the distribution of microbial communities along the Red Sea coast -Studying the deterioration and shortage of indigenous fish species in the Red Sea., Evaluating the effect of solid pollutants and heavy metals on fish and algae distributions.,Attempting to produce biologically effective compounds such as antibiotics or pesticides-Studying the effect of climate change on the species of algae and seaweed endemic in the Red Sea, Restoration of coral reef along the seashore of red sea of Tabuk region.

نشاط المجموعة
Group activity

المجموعة (٢٥)

biochar-based energy storage solution :energy storage solutions	اسم المجموعة Group Name
<ul style="list-style-type: none"> Marwah Alsherif 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Taymour ahmed Shahd alfadhli Ahmed darwish Nawal Alghamdi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Shehab Ahmed ZIA UL HAQ KHAN 	المشاركين من خارج الجامعة Group members from outside the university
<p>The main goal of our research group is to explore the potential for extracting and using biochar obtained from algae and waste material for energy storage solutions which include , Utilize existing resources to research the different types of biochar, their properties and the potential for an energy storage solution, Analyze the different extraction options for gathering biochar, including cost estimates and efficiency ratings of each method operations, such as renewable or sustainable energy -Examine the potential benefits of using biochar in energy storage.</p>	الهوية البحثية للمجموعة Group identity
<ol style="list-style-type: none"> The group's goals are: Research the different types of biochar, their properties, and their potential for energy storage. Determine the different extraction options for gathering biochar and assess the cost and efficiency of each method, It has the potential to improve energy storage solutions, making them more efficient and environmentally friendly. This can lead to advancement in renewable energy sources, electric vehicles, and portable electronic devices. Produce a prototype and published papers based on biochar materials. 	أهداف المجموعة Group goals

- A potential group activity for research on biochar effective electrode could be conducting a collaborative experiment to investigate the impact of different processing parameters on the electrochemical behavior of the biochar electrode. All research work will be done within the Tabuk university Lab. after initialization the central Lab.
- The activity could involve, To do this activity, the group can start by reviewing the current research and applications of biochar in energy storage. Then, each member can contribute their ideas for potential new applications, considering factors such as feasibility, cost-effectiveness, and environmental impact Conducting experiments under standardized conditions, using the same testing protocols and equipment across all teams.
- Analyzing the data and results collaboratively, identifying any trends or patterns in the electrochemical behavior of the biochar electrode, and interpreting the findings collectively.
- Sharing expertise and resources among the teams, such as materials synthesis, electrochemical testing, and data analysis tools.
- Holding regular group meetings and discussions to exchange knowledge and findings, provide feedback on each other's work, and collaboratively identify further areas of investigation.
- Preparing a prototype which is a high efficient green electrode that could be used within battery with high efficiency energy storage.
- By conducting this collaborative experiment, the group could develop a better understanding of the fundamental science underlying the performance of biochar electrodes, advancing the development of this novel technology and contributing to a more sustainable and green energy.

نشاط المجموعة Group activity

المجموعة (٢٦)

Integrated Pest Management Research Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mo'awia Hassan 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Abdulaziz Althbbyani Panneerselvam Chellasamy 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Kadarkarai Murugan 	المشاركين من خارج الجامعة Group members from outside the university
<ul style="list-style-type: none"> The research of our group focuses on developing eco-friendly methods for controlling insect pests in Saudi Arabia. These green protocols include biological agents such as natural enemies (i.e. predators and pathogens) and plant products (green pesticides) against insect vectors of Medical and Agricultural importance. Therefore, our research's main aim is to develop new larvicides, adulticides, and repellents from native medicinal plants as a new and eco-friendly approach to mitigate insect pests. Currently, our group explores the native plants in Saudi Arabia especially from the Tabuk regions as potent anti-insecticidal as well anti-bacterial under laboratory and semi-field conditions without any determinant effect on non-target organisms as well as the environment. 	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> To determine the distribution pattern of Aedes aegypti, Culex pipies, and agricultural pests in the Tabuk area. To collect and identify the native plants in Saudi Arabia to formulate bio-insecticides. Extraction of essential oils plant and use them as stabilizing agents for nanofabrication. Characterization of plant product and its fabricated nanomaterials through spectroscopic and bio-physical techniques. Formulation of green and novel larvicides, adulticides, and repellents against both medical and agricultural importance by standard bio-assay techniques. To study the molecular mechanisms underlying anti-insecticidal effects of selected bio-pesticides by juvenile hormone-specific proteins (mJHBP) of target pests. Finally, to develop anti-mosquitocidal formulations and the commercialization process of our product and services to market. 	أهداف المجموعة Group goals

- Exploring the locally available medicinal plants in Saudi Arabia in the fight against insect pests of medical and agricultural importance.
- Utilizing the plant resources as a capping and stabilizing agent to fabricate/formulate green nano-insecticides to mitigate target insect pests.
- Determination of the anti-insecticidal effect of formulated insecticides by targeting hormone-specific proteins of target pests.
- Commercialization of formulated eco-friendly products at National and International levels.

نشاط المجموعة
Group activity

المجموعة (٢٧)

Eco- friendly and sustainable infrastructure	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mona Obead Albalawi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Moahd Alghuson Abdullah Alghuried 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mohamed Abdel Salam Santosh Kumar 	المشاركين من خارج الجامعة Group members from outside the university
Manufacturing and developing eco-friendly and sustainable road marking paints according to the highest regional and international standards.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Designing and developing road marking paints with high specifications in terms of effectiveness, low environmental damage, and the ability to resist various climatic factors, in line with the university's vision of encouraging development and sustainability. Transferring and localizing the technology of the paint industry to our region. Expanding the participation of researchers from faculty members and postgraduate students to support the research infrastructure at the university. Producing new, innovative, and high-quality materials and marketing them locally and globally, in order to accomplish the university's goal of diversifying funding sources and achieving efficient spending. The final product will be a premium road marking paint that will be economically viable for the university of Tabuk. This research project aims to improve infrastructure and boost road safety in order to improve the community's quality of life. 	أهداف المجموعة Group goals

- Studying the chemical composition of the paints currently used for road markings in the Kingdom of Saudi Arabia.
- Studying the chemical composition of asphalt used in paving roads in KSA.
- Studying the impact of these materials on the environment.
- Studying the reasons for the disappearance of road paints and their low resistance to climatic changes.
- Developing the chemicals used in the preparation of paints by studying the effect of adding some functional groups on increasing the stability and effectiveness of the prepared paints.
- Determining the correct methods of applying paints on roads to ensure a longer life cycle.
- Clarifying the appropriate maintenance and cleaning procedures to reduce the problem of the disappearance of road marking paints and ensure increasing their effectiveness.
- The research will be conducted using instruments and resources available at the University of Tabuk or from an external partner if needed.

نشاط المجموعة Group activity

المجموعة (٢٨)

Tissue regeneration	اسم المجموعة Group Name
<ul style="list-style-type: none"> Menier Alanazi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Hanan M. A. Al Sayed Meshari M Aljohani Fatimah A Alotaibi Mody Albalawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Moustafa M. G Fouda Abdulkareem alanazi Zainab alanazi 	المشاركين من خارج الجامعة Group members from outside the university
<ul style="list-style-type: none"> Fabrication of Novel Wound-Dressing Nanofibers Containing. Microwave-Synthesized Nanoparticles. The urgent need for innovative technologies alternative to conventional processes in order to achieve lower costs, cleaner methods as well as to attain improved product lifetime, quality and performance is a global necessity. 	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> A novel wound dressing will be developed utilizing ZnONPs. In addition to addressing the critical aspects of the mechanism of ZnONPs to support its use as an alternative medicine for wound healing of diabetic patients. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> This project adds value to the medical and surgical field as a whole and to diabetics, particularly if large quantities of vital nanofibers loaded with silver nanoparticles are prepared and loaded with growth factors to produce wound dressings in all their forms and application on the ground. The manufacturing cost is simple and can be easily applied as a prototype. The materials used are cheap, biomedical materials that are suitable for application in many medical aspects, which gives complete safety and no side effects. Keeping abreast of scientific techniques for the application of nanotechnology research in the field of manufacturing medical bandages Applying silver nanotechnology to medical bandages to raise efficiency and improve its functional properties. Reducing the suffering of diabetics from complications of non healing wounds, such as foot amputation. Providing a locally manufactured medical bandage inside the Kingdom with nanotechnology that has no side effects in order to reduce the importer and reduce the economic cost. 	نشاط المجموعة Group activity

المجموعة (٢٩)

Recycling natural and synthetic (industrials) waste to Smart Materials	اسم المجموعة Group Name
<ul style="list-style-type: none"> Nadia Hussein Elsayed 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Raedah Alatawi Duna Alanazi Menier Al- Anazi Aliyah S. Alhawiti Nasser Alamrani Abeer Musaad Amutair 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mohamed Monier Kamal Shalabi Mudasir Ahmad 	المشاركين من خارج الجامعة Group members from outside the university
<p>1- Synthesis and Development smart polymeric materials (high environmental impact through recycling natural and synthetic waste.</p> <p>2- Chemical modification of natural polymers and used biomedical (drug delivery, drugs separation and enzyme trapped) and environmental applications (adsorption of heavy metals from wastewater).</p> <p>3- Protection of equipment and devices from microbial and pitting corrosion by Synthesis based derivative from marine waste.</p>	الهوية البحثية للمجموعة Group identity
<p>1- Recycling natural and synthetic (industrials) waste.</p> <p>2- Uses of natural and synthetic polymers in biomedical and environmental applications.</p> <p>3- Protection of equipment from microbial and pitting corrosion by using smart polymeric materials.</p> <p>4- Publish high impact research papers or patent. Sustainability scientific research in University of Tabuk through the participation of faculty members.</p> <p>6- Transferring the experience between team members</p>	أهداف المجموعة Group goals
<p>Chemical modification of natural (marine product) and industrial waste (plastic) to obtain smart polymers used in different applications:</p> <p>1- purification of waste water by ion imprinted technique</p> <p>2- anti-corrosion-</p> <p>3- biomedical applications</p>	نشاط المجموعة Group activity

المجموعة (٣٠)

Research in Thermal Management and Sustainability Solutions	اسم المجموعة Group Name
<ul style="list-style-type: none"> Nacer Badi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Abdulrhman Alsharari Ayshah Alatawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Rabah Khenata Khan Alam Alex Ignatiev 	المشاركين من خارج الجامعة Group members from outside the university
The research group understands and develops the fundamental properties of sustainable thermal materials, create new applications based on these materials, and disseminate the fundamental and applied knowledge through education, outreach, and technology transfer.	الهوية البحثية للمجموعة Group identity
<ol style="list-style-type: none"> Studying and developing the basic characteristics of organic and inorganic phase change material (PCM) for sustainable thermal management systems. Harnessing nanoscale materials and compounds to serve sustainable thermal management systems. Focusing on cutting-edge research and development with the aim of advancing sustainable thermal management science and technology Providing innovative solutions to difficult problems in the sciences of thermal management (cooling and heating) materials to serve marketing and promote economic growth for society. 	أهداف المجموعة Group goals
<ol style="list-style-type: none"> Cooling photovoltaic panels using phase change materials (PCM) Developing PCM using camel fat. Addressing natural air convective cooling of photovoltaic panels Developing thermal solutions in Building Integrated Photovoltaics (BIPV) 	نشاط المجموعة Group activity

المجموعة (٣١)

Waste to energy and carbon dioxide emission reduction	اسم المجموعة Group Name
<ul style="list-style-type: none"> Nada Mofadi Alatawi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Saham Faryd A Ibarhiam Rasha Mohammed Hassan Omaymah Alaysuy Fatimah A Alotaibi Nada Alkhathami Noha Mohammed Ali Omer Jozaa Nasser Tweher 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Rafat Milad Mohareb 	المشاركين من خارج الجامعة Group members from outside the university
This project will enhance the environmental technology by demonstrating innovative waste-to-energy models. Also, will protect the environment and human health from the adverse effects of waste discharges and emissions to the air, land and water environments.	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Increase resource recovery from used products and minimize the environmental impacts of waste disposal. Identify the best available technologies for the recovery of materials and energy from urban and other residues of human activity. Reducing carbon dioxide emissions using photo -catalysts. Treating wastewater from pollutants, especially removing water pollutants such as pesticides and pharmaceuticals, using nanomaterial, which have great potential in treating polluted water. 	أهداف المجموعة Group goals
<p>1- Demonstrating innovative models for converting waste into energy.</p> <p>2- Developing nanomaterial and improving their efficiency in removing pollutants from water.</p> <p>3- Developing Photo -catalytic for reduction of Carbon Dioxide emission.</p> <p>4- Convert the waste into sustainable energy with less carbon dioxide emissions.</p>	نشاط المجموعة Group activity

المجموعة (٣٢)

Studies on Food Sustainability	اسم المجموعة Group Name
<ul style="list-style-type: none"> Hala Mahmoud Bayomy 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Seham Eid Almasoudi Eman Alamri Nawal Ozaybi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mamoun Muhammed Stan Kubow Ghedeir Muslem Sukhail Alshammari Nora Abdullah Faris Alfari 	المشاركين من خارج الجامعة Group members from outside the university
Our research program focuses on producing and developing microalgae-based high value products to utilize and specify them for food sustainability through producing microalgae-based product with nutritional impact, employing microalgae-based nano-materials for eradication of foodborne pathogens, thus extending food shelf-life with high quality, and developing microalgae-based nanocarriers for effective oral intake of bioactive substances to promote their bioavailability and protecting effect.	الهوية البحثية للمجموعة Group identity
<p>Producing microalgae-based high value products with food preservative and functional impact through integrating functionalized engineered nanoparticles.</p> <p>Demonstrating microalgae-based nanomaterials for eradication of foodborne pathogens and obtaining safety, pathogen-free and sustainable food products.</p> <p>Developing microalgae-based nano/microcarriers for efficient oral intake of bioactive agents to protect against abdominal disorder.</p> <p>Using green methods and natural materials.</p> <p>Producing promising applied high-value product with possibility to employ it in the future in food industry and preservation.</p> <p>Ensure the sustainability of the research program through the development of the capacities and capabilities of faculty members and postgraduate students in the field of food Science.</p>	أهداف المجموعة Group goals

1. Developing functionalized engineered nanoparticles for better harvesting microalgae-based products with high values (integrating engineered nanoparticles with microalgae).
2. Microalgae biomolecules extraction, separation and purification.
3. Synthesis of novel microalgae-based nanomaterials and studying their characterizations and biocompatibility.
4. Studying the physicochemical characterization of the developed nanoparticles.
5. Exploring the antimicrobial activity of microalgae-based nanomaterials against foodborne pathogens.
6. Preparing microalgae-nanocarriers, estimating their bioavailability and encapsulation efficiency, release profile for bioactive substances.

نشاط المجموعة
Group activity

المجموعة (٣٣)

Green energy	اسم المجموعة Group Name
<ul style="list-style-type: none"> Hanadi Abdulaziz Almukhlifi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Ali Moulahi Kholood Alkamis Mohamed Abdellatif Zein 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mjejri Issam 	المشاركين من خارج الجامعة Group members from outside the university
<ul style="list-style-type: none"> Study of Innovative composite based on transition metal oxide and Reduced. Graphene for Energy application. 	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> Accelerate the development of renewable energies. Maintaining a high level of security of supply while respecting environmental requirements. Preparing the energy system of tomorrow. Developing clean mobility. Taking into account the economic and social challenges of the of the energy transition and act with the regions. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Development of new functional composite materials Optimization of synthesis methods Study of the influence of each method on the texture, morphology and crystallinity of the final product Electrodes deposition Morphological and structural characterization of the electrodes Complete assembly of the batteries Electrochemical characterization Evaluation of battery performance in real application 	نشاط المجموعة Group activity

- 1. Material screening and selection:** Conduct laboratory testing on various green materials, such as perovskites, organic dyes, and bioplastics, to evaluate their suitability for use in solar cells.
- 2. Device fabrication and testing:** Developing and prototyping solar cells using the identified green materials to assess their performance and efficiency.
- 3. Performance modeling and simulations:** Using computational modeling and simulation tools to predict and optimize solar cell performance at the material and device level.
- 4. Process and systems optimization:** Investigating ways to optimize the manufacturing process for solar cells to reduce energy use, waste generation, and carbon emissions.
- 5. Environmental impact analysis:** Conducting environmental impact assessments on solar cells to evaluate their overall sustainability, from raw material extraction to end-of-life disposal.
- 6. Techno-economic analysis:** Assessing the cost-effectiveness of solar cells with green materials compared to conventional solar cells, and identifying ways to reduce costs and make solar energy more accessible.
- 7. Industry partnerships and outreach:** Collaborating with industry partners to promote the adoption of solar energy and identify opportunities for commercialization, and engage with policymakers to inform energy policy and regulation.

نشاط المجموعة
Group activity

المجموعة (٣٤)

Medicinal Chemistry and Drug Discovery Research Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Humaira Parveen 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sayeed Mukhtar Mona Obead Albalawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mohmmad Younus Wani Aijaz Ahmad 	المشاركين من خارج الجامعة Group members from outside the university
<p>Our research group works at the interface of chemistry and biology to develop new small molecule inhibitors and novel strategies to combat multidrug resistant infections caused by Bacteria and Fungi. Dr. Humaira and Dr. Sayeed are expert organic chemists who will synthesize novel small molecules and Dr. Wani is an expert medicinal chemist who will design the molecules using molecular modeling and artificial intelligence tools and do the initial screening of the molecules.</p> <p>Dr. Aijaz who is an expert in medical mycology will perform detailed mechanistic studies of the lead molecules to understand the mechanism action of the lead molecules and potential to develop a new drug.</p>	الهوية البحثية للمجموعة Group identity
<p>Develop novel small molecule inhibitors that could circumvent multidrug resistant bacteria and fungi.</p> <p>Develop new strategies and approaches to fudge microbial resistance to known antimicrobial drugs.</p> <p>Train young research scholars and graduate students in the field of medicinal chemistry and drug discovery.</p> <p>Develop a novel antibiotic that could evade multidrug resistance.</p>	أهداف المجموعة Group goals
<p>Synthesis of novel small molecule inhibitors that target the bacterial quorum sensing mechanisms.</p> <p>Developing new antifungal molecules that target the different fungal resistance mechanisms, such as efflux pumps, signaling molecules and biofilms.. Targeting virulence factors in bacteria and fungi by using natural and semi-synthetic molecules.</p>	نشاط المجموعة Group activity

المجموعة (٣٥)

The research group of modern mathematical models of communicable and non-communicable diseases	اسم المجموعة Group Name
<ul style="list-style-type: none"> Weam G. Alharbi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Abdelhalim Ebaid Abdullah F Shater Mohammed M. Jalal. Mounirah Areshi Nada Abdulah Alshomrani 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Carlo Cattani Essam Roshdy El-Zahar 	المشاركين من خارج الجامعة Group members from outside the university

- Investigating the generalized fractional models governing a number of infectious and non- infectious diseases, including Cirrhosis of Liver, Infertility, Tumors, COVID-19, hepatitis B and C viruses, and others.
- Developing modern mathematical models for the vibration of the semi-lunar heart valve and the spread of Nitric-Oxide (NO, toxic substances in the cerebral tissue).
- Obtaining the exact solutions of these generalized models.
- Comparing our results with the results in the relevant literature for each of the studied models.
- Proving that the exact solutions to the current models are in full agreement with the corresponding ones in the literature when the fractional derivative tends to one.
- Proving the advantages of the present method over the methods in the relevant literature
- Discussing the possible applications of the results in the Medical fields, especially, in diagnosing of some brain and heart diseases.
- Development scientific cadres (staff members and students) capable of acquiring science innovations in line with the 2030 vision
- Declaring the association between the results and the 2030 vision currently adopted by Saudi Arabia.

أهداف المجموعة Group goals

The previous published works on the related infectious/non-infectious diseases' models will be gathered and will be well investigated.

- The exact solutions of the generalized models will be obtained.
- Various comparisons between our results with those in the relevant literature as well as the experimental results will be provided for each of the present models.
- The advantages of the present method over those in the relevant literature will be declared.
- Possible applications of the results for diagnosing brain and heart diseases will be discussed in detail.
- Declaring the association between the results and the 2030 vision currently adopted by Saudi Arabia.
- Publishing the obtained results in highly standard ISI-impacted journals.

نشاط المجموعة Group activity

— المجموعة (٣٦) —

Sustainable-Green Solar cell group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Taymour Ahmed 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Saleh Alghamdi Abdalrahamn Alsharary Ahmed Darwish Syed Khassim Eman Fathy Shahd alfadhli 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Matteo Chiesa 	المشاركين من خارج الجامعة Group members from outside the university
<ul style="list-style-type: none"> Our group's theme is innovative approaches to enhance the efficiency of solar cells by using sustainable materials. One way we plan to do this is by extracting photosynthetic material from plants and algae. We aim to showcase the impact of our research by improving solar cell performance and advancing sustainability while minimizing environmental impacts. All the research work will be done within Tabuk university after finalizing the central lab. Our work in green solar cells has the potential to make a significant impact on the environment, technology, agriculture, and various other fields. It offers a promising solution for a more sustainable and energy-efficient future. 	الهوية البحثية للمجموعة Group identity
<ol style="list-style-type: none"> Investigating and identifying new and sustainable green materials for use in solar cell manufacturing. Developing new manufacturing processes and methods that minimize waste and carbon emissions. Optimizing the design and engineering of solar cell systems to increase energy output and reduce environmental impacts. Exploring the potential for integrating green solar cells by creating hybrid systems that are both efficient and sustainable. Conducting life-cycle assessments to quantify the environmental impacts of solar cells and identify ways to minimize these impacts. Produce a high efficient green solar cell as a prototype and published papers based on increasing the efficiency of the solar cell. 	أهداف المجموعة Group goals

The research group focuses on developing several mathematical models of communicable and non-communicable diseases utilizing modern calculus (fractional calculus; FC) and classical calculus (CC). The fractional calculus is a recent science that can be used to accurately describe medical phenomena compared to classical calculus. Currently, this science is witnessing rapid and rapid developments to re-investigate all known medical phenomena hundreds of years ago in the hope of a more accurate understanding of these phenomena.

Therefore the current research group aims not only to reformulate some mathematical models that describe some, communicable and non-communicable diseases, but also to find the optimal solutions for them. As an example, in the field of medical science we know that increasing the spread of nitric oxide in the brain may lead to death. The model currently used for the spread of this substance in the brain is a nonlinear partial differential equation. So we aim to reformulate such equations in view of fractional calculus and then solve it.

This will be accomplished to obtain an accurate amount of the spread of that material and performing comparisons with the experimental results in the light of a more accurate model in the fractional calculus. We also aim, through the research group, to update the mathematical models of the oscillations of the crescent valve of the heart.

The importance of studying these oscillations lies in knowing the conditions under which cardiomyopathy may occur.

Therefore, these conditions can be avoided to contribute to improving the performance of the heart and ensuring the blood flow through the four chambers of the heart (atria and ventricles) in a normal and unsatisfactory manner. In addition, we will update several mathematical models that describe a number of infectious and non-infectious diseases, including Cirrhosis of Liver, Infertility, Tumors, COVID-19, hepatitis B and C viruses, and others. Also, the model of transmission of the deadly AIDS virus will be studied, may Allah protect all, to find out the mechanism of its spread and try to avoid infection from it.

This definitely contributes to the development of scientific cadres capable of absorbing science innovations and in line with the 2030 vision currently adopted by Saudi Arabia.

الهوية البحثية للمجموعة
Group identity

__ المجموعة (٣٧) __

IoT and Transportation Traffic management Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammed Mahmoud Alwakeel 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammed Adnan Hijji Ahmed Mahmoud Alwakeel 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Sami Saleh Alwakeel Mohammed Hameed Alhameed Valentine Aalo 	المشاركين من خارج الجامعة Group members from outside the university
The research program of the group focuses on studying traffic in smart and traditional cities and publishing research and providing products that contribute to monitoring and managing traffic in traditional and smart cities using IoT techniques	الهوية البحثية للمجموعة Group identity
<p>Publishing research that contributes to monitoring traffic of transportation and vehicles in cities IoT techniques</p> <p>Innovating systems and products that contribute to managing traffic for transportation in cities using IoT techniques.</p> <p>Enhancing the use of IoT techniques in transportation.</p> <p>Ensuring the sustainability of the research program at Tabuk University by continuing to provide research and products needed by official concerned authorities and private sector for monitoring and Managing transportation traffic.</p>	أهداف المجموعة Group goals
<p>Publishing scientific research for monitoring and regulating traffic of transportation and vehicles in smart cities and traditional cities using artificial intelligence techniques.</p> <p>Developing a system and product for controlling smart traffic signals to control traffic congestion at intersections using IoT techniques.</p> <p>Developing a system and product for monitoring traffic and giving recommendations to control systems to ensure flexible traffic flow of vehicles using IoT</p> <p>Developing a platform for monitoring vehicle traffic in cities and identifying possible routes to redirect vehicles to avoid traffic congestion using IoT.</p>	نشاط المجموعة Group activity

المجموعة (٣٨)

Intelligent Autonomous Systems Research Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Saleh Albelwi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Abdelrahman Osman Elfaki Anas Bushnag Osama Moh'd Radi Alia Mohammed Alotaibi Ashraf M. Marei 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Fady Alnajjar 	المشاركين من خارج الجامعة Group members from outside the university
<p>This group will focus on solving real-life issues using Intelligent Autonomous Systems.</p> <p>This group is dedicated to developing and building prototypes and practical applications for autonomous systems in areas such as manufacturing, logistics, agriculture, transportation, security. The main goal is developing new algorithms, models, and hardware platforms that enable autonomous systems to perceive, reason, and act in complex and dynamic environments. By Creating intelligent control systems that allow autonomous systems to make decisions in real-time, based on data from sensors, cameras, and other sources. As a result, this leads to the development of new methods for testing and evaluating autonomous systems, ensuring that they meet high standards of safety, reliability, and performance. These solutions will be reflected in enhancing local life which cope with vision 2030.</p>	الهوية البحثية للمجموعة Group identity
<p>Investigate the real life (from local environment, or local community) problems where implementation of autonomous systems will provide concrete solutions.</p> <p>Design intelligent autonomous systems to deal with real-life problems such as disaster zones or space exploration missions etc.</p> <p>Develop the complete intelligent autonomous system.</p> <p>Testing and validating the developed intelligent autonomous system.</p> <p>Collaborate with other researchers, industry partners, and government agencies to advance the field of intelligent autonomous systems and promote their adoption in various domains.</p> <p>Design and build prototypes of autonomous systems, and test them in more challenging environments to evaluate their performance under realistic conditions.</p> <p>Marketing the developed intelligent autonomous system.</p>	أهداف المجموعة Group goals

Designing and building prototypes of autonomous systems, and testing them in real-world environments.

Investigating the use of autonomous systems for disaster response and recovery efforts, such as search and rescue, environmental monitoring, and infrastructure inspection.

Conducting research on the development of autonomous systems, including robots, drones, and self-driving vehicles.

Investigate the use of machine learning and other AI techniques to enable autonomous systems to learn from experience and improve their performance over time.

Developing new algorithms and models for autonomous navigation in challenging environments

Exploring potential of autonomous systems to transform industries and improve people's lives.

Publish high quality research papers and present our work at conferences to share our findings and contribute to the broader scientific community.

Conduct and organize local and international research and workshops for providing knowledge acquisition and knowledge sharing channels.. This group has published already 3 papers related to his research interest which are:

A SLAM-Based Localization and Navigation System for Social Robots: The Pepper Robot Case

<https://www.mdpi.com/2075-1702/11/2/158>

A Systematic Approach for Exploring Underground Environment Using LiDAR-Based System

<https://www.techscience.com/CMES/v136n3/51814>

Revolutionizing Social Robotics: A Cloud-Based Framework for Enhancing the Intelligence and Autonomy of Social Robots

<https://www.mdpi.com/2218-6581/12/2/48>

Currently, we have a running proved prototype of autonomous robot for exploring deep wells.

نشاط المجموعة
Group activity

المجموعة (٣٩)

The Internet of Things (IoT)	اسم المجموعة Group Name
Adel R. Alharbi	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Amer Aljaedi Abdullah Aljuhni 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Sajjad Jamal Tariq Shah 	المشاركين من خارج الجامعة Group members from outside the university
The Internet of Things (IoT) research group focuses on connecting people and things at anytime, anywhere, with anything and anyone, ideally using any network and any service. Technologies have made IoT feasible and practical. The following technologies are the focus of the group's research: sensors, security, cloud computing, healthcare, big data, blockchain, machine learning algorithms	الهوية البحثية للمجموعة Group identity
The Internet of Things (IoT) research group focuses on connecting people and things at anytime, anywhere, with anything and anyone, ideally using any network and any service. Technologies have made IoT feasible and practical. The following technologies are the focus of the group's research: sensors, security, cloud computing, healthcare, big data, blockchain, machine learning algorithms.	أهداف المجموعة Group goals
<p>Develop IoT systems that will be able to self-report in real-time, increasing efficiency and surfacing critical information more quickly than those that rely on human interaction</p> <p>Traditional machine learning algorithms may fail while applying decentralized data collected from IoT devices. Since the nature of the algorithms is to get entire training data at once and generate a rich model which is capable of predicting unseen class labels during a test phase</p> <p>The light-weighted Internet of Things (IoT) is getting strong and powerful for the implementation of machine learning algorithms for the purpose of network monitoring and user activity management</p> <p>The group investigate the process of data collection and its issues, and the impact of Big Data in IoT, general IoT challenges, particularly the challenges of machine learning in IoT, and associated novel solutions to address them</p>	نشاط المجموعة Group activity

المجموعة (٤٠)

Future Economics: Identity Security in Cyberspace using AI based Multimedia Forensics	اسم المجموعة Group Name
<ul style="list-style-type: none"> Lubna Alharbi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Jasim Alnahas A'aeshah Alhakamy 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Hafiz Malik 	المشاركين من خارج الجامعة Group members from outside the university
Our research program focuses on the analysis of biometric anti-spoofing by analyzing the facial and vocal features examination through machine learning and deep learning. Our goal is to map the human thought process involved in biometric anti-spoofing and develop such models that can predict the real and spoof user identity by adding a protective anti-spoofing layer to biometric systems to combat a variety of facial or voice spoofing attacks in a precise manner	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> a. Automating the detection procedure followed in biometric anti-spoofing by mapping the human thought procedure b. To design and develop effective audiovisual anti-spoofing models that can generalize well to unseen cases c. To develop adversarial attack-resistant models for audio-visual spoofing detector d. To design and develop such biometric anti-spoofing solutions which are capable of detecting multi-type audiovisual spoofing robustly e. Efficient and effective solutions to ensure that the forensic analyzers may trust the automated solutions to get timely and accurate verification of user-identity 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> a. Analyze audiovisual stream by applying computer vision techniques b. Models development through machine learning (ML) and deep learning (DL) techniques to accurately identify the real and spoof user identity in the biometric systems based on audiovisual stream c. Analysis of audio-visual spoofing detector under the presence of multi-type spoofing attacks through ML and DL techniques d. Analysis of various adversarial attacks in the audiovisual stream and their impact on the biometric anti-spoofing detector e. Analysis of generalization ability of audiovisual biometric anti-spoofing detector through ML and DL techniques 	نشاط المجموعة Group activity

المجموعة (٤١)

<ul style="list-style-type: none"> Artificial Intelligence Group (A.I.) and Educational Environment 	اسم المجموعة Group Name
<ul style="list-style-type: none"> Ahmed Mahmoud Alwakeel 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammed Mahmoud Alwakeel Mohammed Mustafa Ali 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Valentine Aalo Sami Saleh Alwakeel Abdulrahman Khalid Alnaim 	المشاركين من خارج الجامعة Group members from outside the university
<p>The research program of the group focuses on using artificial intelligence technologies to enhance educational environment management and achieve learning outcomes through conducting research and delivering products using artificial intelligence technologies that help faculty members in universities and teachers in schools achieve learning outcomes. The research group also aims to innovate products and applications that enhance educational environment management and achieve learning outcomes using artificial intelligence technologies.</p>	الهوية البحثية للمجموعة Group identity
<p>Conducting and publishing research that contributes to enhancing educational environment management and achieving learning outcomes in universities and schools using artificial intelligence technologies, Innovating products, systems, and applications for managing the educational environment in universities and schools using artificial intelligence technologies</p> <p>Innovating products, systems, and applications to enhance the achievement of learning outcomes in universities and schools using artificial intelligence technologies.</p> <p>Promoting the use of artificial intelligence technologies in universities and schools</p> <p>Working to ensure the sustainability of the research program at Tabuk University by continuing to provide the research and products needed by official stakeholders and the private sector to manage the educational environment and achieve desired learning outcomes.</p>	أهداف المجموعة Group goals
<p>Publishing scientific research to manage the educational environment and enhance the achievement of learning outcomes in universities and schools using artificial intelligence technologies, Developing a system and product for managing the educational environment in universities and schools using artificial intelligence technologies, Developing a system and product to enhance the achievement of learning outcomes in universities and schools using artificial intelligence technologies</p> <p>Developing a platform for managing the educational environment in universities and schools using artificial intelligence technologies.</p>	نشاط المجموعة Group activity

المجموعة (٤٢)

Federated Learning based Human Blood Glucose Level Estimation via Non-Invasive Data	اسم المجموعة Group Name
<ul style="list-style-type: none"> Narmatha Chellamani 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Saleh Albelwi Palanisamy Amirthalingam Emad Alharbi Jawhara Bader Aljabri Kousalya Prabahar Kaliamoorthy Manimurugan Shanmuganathan 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> ANAND PAUL 	المشاركين من خارج الجامعة Group members from outside the university
<p>Diabetes is a metabolic pathological condition of concern that affects the vital organs of the body due to the lack of monitoring. In addition, level of the blood glucose is important to avoid complications of diabetes. Usually, the glucose measurement uses invasive data which generally involves finger puncturing. These methods are painful and frequent pricking causes calluses on the skin and have the risk of spreading infectious diseases. Therefore, there is a need to develop a non-invasive monitoring system which can measure blood glucose continuously. This research proposes an In-vitro glucose measurement prototype using non-invasive datas from the subject (patient) via the sensor or Near Infrared (NIR). Federated learning is also going to be used to improve the accuracy level of the decision and it protects the acquired data from the third parties.</p>	الهوية البحثية للمجموعة Group identity
<ul style="list-style-type: none"> To investigate different Human Blood Glucose Level (HBGL) estimation from related works analysis. To develop a suitable prototype/ method which will address the existing problems of HBGL. To validate the developed system performances with existing systems and using experts. To publish the proposed research in high impact journals. To file the proposed approach in US/ Saudi patent. 	أهداف المجموعة Group goals
<ul style="list-style-type: none"> Identify the subject experts based on the work among the team members. Split the works and assign to them. Periodical monitor and validate the assigned work and assist by the PI /experts /consultants. The developed work will be validated through the proper channel. Prepare the required documents for publications. 	نشاط المجموعة Group activity

المجموعة (٤٣)

The "Smart Cities" Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammad Hijji 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Wahid Rajeh Slim Ben Chaabane Ali Alshehri Rafika Harrabi Zaid Bassfar 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Khan Muhammad Muhamm ad Sajjad Amin Ullah 	المشاركين من خارج الجامعة Group members from outside the university
<p>The "Smart City" Group (TSCG) investigates technologies for transforming visual analytics into knowledge to solve real-world problems for serving humanity. TSCG focuses on multidisciplinary research by exploring the concepts of AI, Computer Vision, Medical, and Cognitive Sciences towards innovations. More specifically, TSCG research activities span from intelligent video surveillance (fire/smoke scene analysis/disaster management) to medical image analysis and from information security to smart cities, covering Internet of Things (IoT), Internet of Multimedia Things (IoMT) and Internet of Everything (IoET). TSCG strongly collaborates with more than 20 research teams around the globe and more experts can be invited to the research activity as per the needs. TSCG visions towards a leadership position in the R&D areas, constituting visual analytics and intelligent surveillance for smart city development whose beneficiaries include NEOM and Kingdom of Saudi Arabia under the vision 2030.</p>	الهوية البحثية للمجموعة Group identity
<p>1. Serving humanity by solving real-world and challenging problems by investigating the latest technologies of mutual interest.</p> <p>2. Exchange of expertise and information sharing between academia and industry for better innovations and development. Increasing the global impact and ranking of University of Tabuk by joint research projects via expertise of diverse research team members including directors, consultants, and co-researchers from different countries such as South Korea, Norway, and USA.. Proposing novel solutions to help and support the development of "The LINE", a proposed smart city in Neom, Tabuk under the Saudi Vision 2030.</p>	أهداف المجموعة Group goals

1. Inventing and developing novel solutions for smart city development and intelligent surveillance.
2. Joint patents registration of novel solutions and excellent research publications in top-tier Q1 rank SCIE journals.
3. Prototypes development and deployment feasibility analysis within the Kingdom of Saudi Arabia.
4. Conducting special sessions and workshops for students/researchers/faculty members of the University of Tabuk for joint research sharing and discussions towards global innovations of mutual interest.

نشاط المجموعة
Group activity

المجموعة (٤٤)

Research Group for Developing and Implementing Smart and Sustainable Robotics Technology for Agriculture	اسم المجموعة Group Name
<ul style="list-style-type: none"> Tahani AlKhudaydi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Slim BEN CHAABANE Rafika HARRABI Lubna Alharbi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Wedad obaidallah Alahamade Beatriz de la Iglesia 	المشاركين من خارج الجامعة Group members from outside the university
We strive to create intelligent solutions for fruit harvesting with a focus on improving efficiency and sustainability. We aim to develop robots to perform harvesting tasks with minimal human intervention. In addition we will explore optimizing the harvesting process using data analytics and machine learning. Overall, our group is dedicated to develop innovative and sustainable solutions for fruit harvesting	الهوية البحثية للمجموعة Group identity
<p>Develop smart robots that can perform fruit harvesting tasks with minimal human intervention.</p> <p>Identifying the optimal time for harvesting and selectively harvesting fruits based on their ripeness.</p> <p>Improve the overall efficiency and sustainability of fruit harvesting through data analytics and machine learning.</p> <p>Create innovative and sustainable fruit harvesting solutions that benefit farmers and the environment.</p> <p>Providing research opportunities for faculty members and post-graduate students</p>	أهداف المجموعة Group goals
<p>Conduct research and development of robotics technology for fruit harvesting.</p> <p>Collaborate with industry partners to implement smart fruit harvesting solutions.</p> <p>Utilize data analytics and machine learning to optimize fruit harvesting processes.</p> <p>Conduct field trials in real-world scenarios and conditions and test and refine innovative harvesting solutions' functionality and effectiveness under these circumstances.</p> <p>Communicate research findings through publications and presentations.</p> <p>Deploy the final prototype as a product to be utilized in the field.</p>	نشاط المجموعة Group activity

المجموعة (٤٥)

Cyber Security Research Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Amer Aljaedi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Adel R. Alharbi Abdullah Aljuhni 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Tariq Shah Sajjad Jamal 	المشاركين من خارج الجامعة Group members from outside the university
<p>The research group focuses on developing cryptosystems that enable private and genuine transmission channels for information over an insecure networks, where both efficiency in transmission and security are essentially required in such large-scale inter-connected information systems. The research team adheres to compete with state-of-the-art solutions and emerging security technologies in providing the novel encryption algorithms and techniques that serve innovative solutions adopted in the fourth industrial revolution.</p>	الهوية البحثية للمجموعة Group identity
<p>Developing novel encryption scheme for smart grid networks to server various transactions of smart city networks and agriculture grid operations.</p> <p>Designing light-weight encryption schemes for low power devices that are widely utilized in grid systems and smart city operations.</p> <p>Developing innovative, specialized mini-cryptographic devices to accelerate processing ciphertxts in IoT networks.</p> <p>Investigating various signal transmission channels and media for underwater sensor networks that can server security operations for navy or military operations.</p>	أهداف المجموعة Group goals
<p>Creating specialized research lab for developing cryptosystems and algorithms.</p> <p>Investigation different optimization schemes for the standard encryption methods used widely in the industry.</p> <p>Developing a novel, empirical test-bed environment to conduct experimental research for secure and covert signal transmission in underwater sensors networks.</p>	نشاط المجموعة Group activity

المجموعة (٤٦)

Environmental Information Systems Research Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Ashraf M. Marei 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> El-Hadi M. Aggoune Tareq Alhmiedat Mohammad Ayaz 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Imran Razzak 	المشاركين من خارج الجامعة Group members from outside the university
The focus of our group is developing affordable and accurate meteorological systems to obtain data and information that support decision making relating to clean, safe, and sustainable environment.	الهوية البحثية للمجموعة Group identity
<p>Research the existing meteorological systems that have been developed recently.</p> <p>Discuss and analyze the performance of existing meteorological systems in terms of cost and power-consumption</p> <p>Design a meteorological system through employing the LoRaWAN network server.</p> <p>Develop a low-cost and low-power consumption meteorological base-stations.</p> <p>Involve external stakeholders (Company representatives,...)</p> <p>Filling protection for intellectual property (patent application, ...)</p>	أهداف المجموعة Group goals
<p>Prototype preliminary design for the meteorological base-station</p> <p>Involve external partner</p> <p>Product development</p> <p>Publication</p>	نشاط المجموعة Group activity

المجموعة (٤٧)

Proactive Risk Management through Improved Cyber Situational Awareness	اسم المجموعة Group Name
<ul style="list-style-type: none"> Majed Aborokbah 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Ahamed Aljuhani Manimurugan Shanmuganathan 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Hussain Aldawood Tawfiq Alashoor 	المشاركين من خارج الجامعة Group members from outside the university
<p>This group aims to improve an organization's ongoing awareness of the risk posed to its business by cyber security attacks. The group research will make key contributions to achieve enhanced situational awareness programs. This project will be designed to provide solutions for public domain Cyber Security Incident Response Team (CSIRT) and small and medium-sized enterprises (SME's) who both have needs outside the mainstream of cyber security solution provision. Public CSIRTs needs arise in part because commercial tools do not address their unique requirements. This has created a shortfall, clearly articulated by many cyber security agencies, of tools with the required analytical and visualization capabilities to enable public CSIRTs provide optimized services to their constituency. SME's also are vulnerable to cybercrime as they have limited resources to protect themselves and often a limited understanding of what needs to be done.</p>	الهوية البحثية للمجموعة Group identity
<p>To develop and implement a comprehensive approach to cyber-security risk management that leverages improved cyber situational awareness.</p> <p>Using of advanced technologies and tools to detect and respond to cyber threats in real-time, as well as the development of policies and procedures to guide risk management activities in small and medium-sized enterprises</p> <p>To improve organizational resilience to cyber threats and minimize the impact of cyber incidents on critical assets and operations.</p> <p>Develop a model for assessing and selecting mitigation measures</p>	أهداف المجموعة Group goals

Develop a comprehensive understanding of the cyber threat landscape and its evolving nature

Identify key vulnerabilities and risks in the organization's cyber infrastructure

Establish policies and procedures to guide proactive risk management activities

Develop and implement training programs to enhance employee awareness and response to cyber threats.

Evaluate the effectiveness of the proactive risk management approach in reducing cyber risks and improving organizational resilience to cyber incidents

Research findings will be published in one of the indexed journal in web of science

نشاط المجموعة
Group activity

المجموعة (٤٨)

Cybersecurity issues and solutions for industrial IoT	اسم المجموعة Group Name
<ul style="list-style-type: none"> Ahamed Aljuhani 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Majed Aborokbah Anas Bushnag Jawhara Bader Aljabri 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Hussain Aldawood Tawfiq Alashoor Goran Novkovic Mohammad Baroom 	المشاركين من خارج الجامعة Group members from outside the university
<p>The goal of this research topic is to bring together recent research efforts devoted to studying the security and privacy of Industrial Internet of Things. The group will investigate security and privacy issues in Industrial Internet of Things, and explore potential solutions to mitigate cyberattacks in such a connected network. In addition, recent advances in AI-driven techniques for preserving security and privacy in the industrial IoT will be investigated. The research group aims to compete with existing solutions and emerging security technologies in providing novel security methods that serve innovative solutions which will be integrated in the Industrial IoT domain.</p>	الهوية البحثية للمجموعة Group identity
<p>To identify and address the key cybersecurity challenges in the Industrial Internet of Things (IIoT) landscape.</p> <p>Develop novel security approaches to mitigate the privacy and security risks in the current IIoT systems</p> <p>Using cutting-edge technologies to improve protection solutions against cybersecurity threats in Industrial Internet of Things.</p> <p>Investigating the involvement of artificial intelligence in designing and developing security solutions for IIoT environments.</p>	أهداف المجموعة Group goals
<p>Investigate cybersecurity issues and challenges in the current Industrial Internet of Things systems.</p> <p>Develop effective solutions to ensure the security, privacy, and resilience of Industrial IoT systems.</p> <p>Develop security-by-design and privacy-by-design framework for Industrial Internet of Things</p> <p>Develop artificial intelligence- driven methods to overcome cyber-security challenges in IIoT environments.</p> <p>Demonstrate research findings with the state-of-the-art solutions</p>	نشاط المجموعة Group activity

المجموعة (٤٩)

Identity Security in Cyberspace	اسم المجموعة Group Name
<ul style="list-style-type: none"> Wahid Rajeh 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Umar Albalawi Osama Younes 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Tawfiq Alashoor 	المشاركين من خارج الجامعة Group members from outside the university
Identifiable information leaks out when people use the Internet. It is possible to infer individual preferences from social groups via data aggregation. It is important to secure personal data in cyberspace to prevent identity theft, fraud, data breaches and other malicious activities. The aim of this research group is to maintain security and privacy of digital identity from cybercriminals or misusing identity	الهوية البحثية للمجموعة Group identity
<p>Identify the strengths and weaknesses of current identity security measures and to develop more effective methods for protecting personal data in cyberspace.</p> <p>Developing new methods that can improve security protection of user identity in cyberspace</p> <p>Identify the factors that influence human behavior in terms of identity security and privacy</p> <p>Evaluate the impact of identity security breaches on individuals and organizations</p> <p>Development of policies and regulations that can ensure better protection of personal data in cyberspace</p>	أهداف المجموعة Group goals
<p>Investigate identity security issues in cyberspace and identify challenges in the current methods</p> <p>Develop effective solutions to maintain security and privacy of user identity in cyberspace</p> <p>Develop security-by-design framework for identify security in cyberspace</p> <p>Demonstrate research findings with the state-of-the-art security solutions for identify security in cyberspace</p>	نشاط المجموعة Group activity

المجموعة (٥٠)

Intelligent Device for Electrical Power Management	اسم المجموعة Group Name
<ul style="list-style-type: none"> Husam S. Samkari 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> el-Hadi M. Aggoune Tahani AlKhudaydi Omar Albalawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Muhammad Imran Sami Alwakeel 	المشاركين من خارج الجامعة Group members from outside the university
<p>Our research group focuses on developing an intelligent device for electrical power management (IDEPM) that utilizes artificial intelligence (AI), including machine learning (ML), expert systems (ES), and deep learning (DL), to improve efficiency in energy consumption. The IDEPM uses real-time human activities in the building as inputs for its decisions to manage pre-defined controllable loads. Furthermore, the IDEPM can communicate with utility-owned DSMs during off-peak hours to reduce the peak-to-average ratio (PAR) in a smart grid system. The proposed IDEPM will act on the benefits of both the utility and the customer by peak shaving and reducing energy expenses, respectively. A modified prosumer "smallscale" virtual power plant (VPP) concept will be developed in the IDEPM to allow us to integrate distributed energy resources such as photovoltaics, batteries, and electric vehicles into the consumer system. Smart thermostats, lighting, plugs, and air conditioning are connected to the IDEPM through communication channels.</p>	الهوية البحثية للمجموعة Group identity
<p>1. Contribute to the improvement of efficiency in energy consumption to conserve the natural resources of the kingdom and support the Saudi Vision 2030.</p> <p>2. Support the integration effort of environmental technologies such as photovoltaics, batteries, and electric vehicles into the consumer electrical power system, which can be applied in renewable energy-based projects such as NEOM and Red Sea.</p> <p>3. Utilize advanced technologies based on AI (ML, ES, and DL) to mitigate the adverse impacts of excessive energy consumption</p>	أهداف المجموعة Group goals

1. Specifying and connecting controllable loads, such as thermostats (heating, air conditioning, ...), lighting, and outlets (appliances).
2. Considering first small-scale applications and gradually apply to larger scales (for example, room, building, and campus).
3. Gathering historical data/information about power consumption behavior to make a case for intelligent device for electrical power management (IDEPM).
4. Developing the IDEPM that utilizes AI (ML, ES, and DL) to improve efficiency in energy consumption.
5. Establishing a process that balances interests while safeguarding grid integrity between the utility and the consumer.
6. Managing distributed energy resources such as photovoltaics, batteries, and electric vehicles.

نشاط المجموعة
Group activity

المجموعة (أ)

Advanced Power Electronics and Power Planning for Renewable Energy Systems	اسم المجموعة Group Name
<ul style="list-style-type: none"> Saeed Alzahrani 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammad Altimania Fares Alromithy Ahmed Alzahmi Fahad M. Almasoudi Khaled S. Alatawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Antonio Conejo Salem Batiyah Musfer Alraddadi Abdoalateef Alzahrani Ruwaybih Alsulami 	المشاركين من خارج الجامعة Group members from outside the university
The research group would be focused on developing innovative solutions to the challenges of integrating renewable energy sources into the power grid. The group may explore novel approaches to power converter circuit design, and electromagnetic devices, power planning, and optimization, and may also investigate emerging technologies such as machine learning and artificial intelligence for renewable energy systems.	الهوية البحثية للمجموعة Group identity
The objectives of this research group are to investigate the development of optimal power converter circuit designs and power planning strategies for renewable energy systems. The group research will focus on the following aspects: 1. Development of power converter circuit designs for different types of renewable energy sources, such as solar, and wind power.. Optimization of power converter circuits to minimize power loss and maximize energy efficiency.. Development of optimal power planning and optimization strategies for renewable energy systems.Evaluation of the performance of renewable energy systems using power converters and optimization strategies in real-world scenarios.	أهداف المجموعة Group goals

- 1- Literature review:** A thorough literature review of existing power converter designs for renewable energy systems can provide insights into the advantages and limitations of existing designs. This can help in identifying the optimal power converter topology and components for a specific renewable energy source.
- 2. Simulation and modeling:** Theoretical modeling and simulation of the power converter circuit can help in evaluating its performance under different operating conditions. Simulation tools such as MATLAB, GAMS, PLECS, PSCAD, and PSIM can be used to model and simulate the power converter circuit.
- 3. Design and testing:** The design and testing of the power converter circuit is a critical aspect of the research. The design involves the selection of the optimal components for the power converter circuit, while the testing involves the evaluation of its performance under different operating conditions. The testing can be performed in a laboratory setting or in the field.
- 4. Optimization:** Optimization techniques such as genetic algorithms, particle swarm optimization, and ant colony optimization can be used to optimize the performance of the power converter circuit. The optimization can be performed based on factors such as energy efficiency, reliability, and cost-effectiveness.
- 5. Control strategies:** The performance of the power converter circuit can be improved by using different control strategies such as maximum power point tracking (MPPT), pulse width modulation (PWM), and sliding mode

نشاط المجموعة
Group activity

المجموعة (٥٢)

Urban Mobility	اسم المجموعة Group Name
<ul style="list-style-type: none"> Moahd Alghuson 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Abdullah Alghuried Abdulaziz Alotaibi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Khaled Abdelghany 	المشاركين من خارج الجامعة Group members from outside the university
Recent advances and development in transportation prompted the acceleration toward innovating and developing more intelligent and more sustainable infrastructure to adopt emerging technology. This group research will focus on creating an innovative technology that will be suitable for futuristic technology which is rapidly developing to be in the real world soon	الهوية البحثية للمجموعة Group identity
<p>1- File a patent to commercialize the proposed system.</p> <p>2- Taking advantage of the rapid change happening in the transportation field.</p> <p>3- Becoming pioneers in terms of technology localization of the smart infrastructure domain.</p> <p>4- Use the surrounding resources and capabilities in the university and the region of Tabuk to conduct necessary experimentation.</p>	أهداف المجموعة Group goals
<p>1- Develop an autonomous intersection control that can manage and improve traffic throughput.</p> <p>2- Design an innovative protocol to deploy autonomous vehicles in the intersection.</p> <p>3- Conduct simulation and experimentation studies to ensure the stability of the system.</p> <p>4- Submit patent filing to commercialize the proposed system</p>	نشاط المجموعة Group activity

المجموعة (٥٣)

Energy Storage Group (Environmentally Sustainable Technology)	اسم المجموعة Group Name
• Shaikh Hasibul Majid	رئيس المجموعة Principle investigator
• Taha Abdel shafy Khalaf • Walaa R. Abd Elrah man	المشاركين من منسوبي الجامعة Group members from the university
• Shohel Mahmud • Khan Arif Wahid	المشاركين من خارج الجامعة Group members from outside the university
Environmental Technology	الهوية البحثية للمجموعة Group identity
Theoretical/experimental analyses, design optimization, and product development and testing	أهداف المجموعة Group goals
Energy Storage, efficiency, management using IoT, control, and transformation	نشاط المجموعة Group activity

المجموعة (٥٤)

Energy management & control)	اسم المجموعة Group Name
<ul style="list-style-type: none"> Hani Albalawi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sherif Ahmed Zaid Farag Adel Alatawi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mohamed Ahmed Moustafa Hassan 	المشاركين من خارج الجامعة Group members from outside the university
<p>This research group focuses on developing the management and control of renewable energy systems, which include all types of renewable energy technologies and energy storage systems. Our aim is to develop novel management and control techniques for power systems that utilize different renewable energy technologies. Currently, we are working on applying modern control techniques, such as model free predictive control, to a two-area interconnected modern power system</p>	الهوية البحثية للمجموعة Group identity
<p>Maintain the study program's viability by developing the skills and capabilities of faculty members and postgraduate students in the area of renewable energy systems. Promoting an innovative and creative mindset in the management and control of green energy sources. Create novel management and control methods for energy systems that utilizes renewable energy sources. - Transfer and localization of technology for handling and controlling green energy sources and energy storage systems.</p>	أهداف المجموعة Group goals
<p>Developing management and optimum controllers for the renewable energy sources Developing Renewable energy forecasting and demand response management techniques Exploring and managing new energy storage systems for renewable energy systems Improving the performance of isolated energy systems.</p>	نشاط المجموعة Group activity

المجموعة (٥٥)

AI Techniques for Solar Energy Applications	اسم المجموعة Group Name
<ul style="list-style-type: none"> Aadel Mohammed Alatwi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Hazem Mohammed El-Hageen Shaikh Hasibul Majid Osama Moh'd Alia Tareq Alhmiedat 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Syeda Humaira Tasnim 	المشاركين من خارج الجامعة Group members from outside the university
<p>focused on developing advanced image processing techniques for improving the efficiency and maintenance of solar panel systems. The work involves using AI algorithms and machine learning techniques to analyze images captured by cameras or drones, with the goal of identifying defects, damages, or performance issues in solar panels. By analyzing large amounts of image data, this research is able to detect and diagnose problems quickly, enabling solar panel system operators to take corrective actions before they become major issues</p>	الهوية البحثية للمجموعة Group identity
<ol style="list-style-type: none"> 1. Developing AI algorithms and machine learning models for identifying defects, damages, or performance issues in solar panels using image data. 2. Creating large datasets of images of solar panels with known defects or issues for training and testing AI models. 3. Investigating new approaches for analyzing and processing images of solar panels to improve the accuracy and speed of defect detection. 4. Developing predictive maintenance models that can anticipate issues in solar panels before they occur, reducing downtime and improving system reliability. 5. Collaborating with industry partners to integrate AI-powered image processing tools into existing solar panel monitoring systems. 	أهداف المجموعة Group goals

- 1. Collecting image data:** The research group collects large amounts of image data of solar panels, including both visible and infrared images, using cameras or drones.
- 2. Image processing:** The group develops and applies advanced image processing techniques, such as object detection, defect classification, and anomaly detection, to identify and diagnose issues in solar panels.
- 3. Developing AI models:** The group uses machine learning algorithms and deep learning techniques to train models with the large datasets of solar panel images, enabling automated defect detection and predictive maintenance.
- 4. Collaborating with industry partners:** The research group works closely with industry partners to integrate AI-powered image processing tools into existing solar panel monitoring systems.
- 5. Disseminating research results:** The group presents their research findings at conferences and publishes papers in academic journals to share their advances with the wider research community. Through these activities, the Image Processing for Solar Panels System using Artificial Intelligence research group aims to improve the reliability and effectiveness of solar panel systems, helping to drive the adoption of clean energy and contributing to a more sustainable future.

نشاط المجموعة Group activity

المجموعة (٥٦)

Improving the performance of solar panels systems	اسم المجموعة Group Name
<ul style="list-style-type: none"> Hazem Mohammed El-Hageen 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Hani Albalawi Yousef Hussein Alfaifi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Low, Tang Jung 	المشاركين من خارج الجامعة Group members from outside the university
Our research group interests on development of smart solar monitoring systems and cleaning applications to keep solar panels clean, automatic connections and continuous monitoring. This would improve the efficiency of these systems to increase the energy produced and reduce maintenance, operation and production costs.	الهوية البحثية للمجموعة Group identity
The main purpose is the integration of sensors, actuators and (artificial intelligent) AI algorithms with different configurations/ conditions to provide autonomous applications with a smart system that supports 1) solar panel cleaning, 2) optimizing operation and management and maintenance of solar systems plants, 3) maximizing the produced energy and minimizing its cost 4) Supporting and achieving cooperation and companies with parties outside the university 5) Enriching university faculty members with practical and research .skills and experiences	أهداف المجموعة Group goals
Develop robust and efficient cloud-based tracking systems that provide real-time monitoring from remote locations. 2 . Develop systems and tools for detecting faults and dirt, and then controlling, cleaning the solar panels . 3 . Integrate of various technologies from electronic circuits, wireless sensors, mechanical parts and AI algorithms to develop effective monitoring, control, cleaning and cooling systems for solar energy systems.	نشاط المجموعة Group activity

المجموعة (٥٧)

Future Economics: Analysis of the Financial Markets	اسم المجموعة Group Name
<ul style="list-style-type: none"> Ahmed Alzahmi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammad Altimania Fares Alromithy Mohammed Alswat Jasim Alnahas 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Hafiz Malik SMuteb Aljasem 	المشاركين من خارج الجامعة Group members from outside the university
<p>Our research program focuses on the analysis of financial markets by applying time series analysis techniques e.g. exponential moving averages, relative strength indicators, ichimoku cloud etc., natural language processing techniques, and predictive modeling through machine learning and deep learning. Our goal is to map the human thought process involved in financial decision making and develop the models that can predict the price movements in financial markets in a precise manner. Our research program focuses on the analysis of financial markets by applying time series analysis techniques e.g. exponential moving averages, relative strength indicators, ichimoku cloud etc., natural language processing techniques, and predictive modeling through machine learning and deep learning. Our goal is to map the human thought process involved in financial decision making and develop the models that can predict the price movements in financial markets in a precise manner.</p>	الهوية البحثية للمجموعة Group identity
<p>Automating the analysis procedure followed in financial markets by mapping the human thought procedure b. Rationalizing the decision making by overcoming the psychological factors i.e. FOMO that cause the wrong decision making for the investors c. Through efficient and effective analysis to ensure that the investors may become able to get maximum return on their investments</p>	أهداف المجموعة Group goals
<p>Analyze financial market data by applying data analysis techniques b. Model development through machine learning (ML) and deep learning (DL) techniques to accurately predict price movements of the entities in financial markets c. Sentiment analysis of the financial news through NLP, ML and DL techniques d. Correlation and causation extraction for collective market segments e. Sentiment analysis of the tweets and their impact on the stock market and other financial markets. f. Risk management and efficient portfolio calculations</p>	نشاط المجموعة Group activity

المجموعة (٥٨)

SmartLink Group (Future Economics - Smart Cities)	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammed Alhartomi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Fares Almeahmadi Saeed Alzahrani 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Jaafar Elmirghani Ruwaybih Alsulami Omar Al-Hartom 	المشاركين من خارج الجامعة Group members from outside the university
<p>The focus of SmartLink Group is on the Design of Free Space Optical Link for Smart Cities Applications.</p> <p>Research Group Mission: To design and develop a reliable, efficient, and secure free space optical (FSO) link that can enable high-speed wireless communication in smart cities and support various smart city applications, such as traffic management, environmental monitoring, and public safety . Research Group Vision: To become a leading research group in the field of FSO communication technology for smart city applications and to contribute to the development of sustainable and resilient smart cities. Research Group Values: Innovation: SmartLink group strives to be at the forefront of FSO communication technology research and develop new ideas and approaches to solve complex smart city communication challenges . Collaboration: SmartLink group values teamwork and believes that collaboration with other research groups, academic institutions, industry partners, and government agencies is essential to achieve our research goals . Excellence: SmartLink group members are committed to achieving excellence in all aspects of our research, from the design and development of the FSO link to the evaluation of its performance in smart city applications. Sustainability: SmartLink group recognizes the importance of sustainable and resilient smart cities and aims to develop FSO</p> <p>communication technology that is energy-efficient, environmentally friendly, and socially responsible. Diversity and Inclusion: We embrace diversity and strive to create a welcoming and inclusive research environment that values and respects differences in race, gender, ethnicity, nationality, religion, and culture.</p>	
الهوية البحثية للمجموعة Group identity	

The research goals are to develop and optimize a Free Space Optical (FSO) link that can provide high-speed and reliable data transmission for various Smart Cities applications. Some specific research goals of this project may include:

1. Develop a mathematical model to simulate and optimize the performance of FSO links for different Smart Cities applications such as traffic management, surveillance, Ground-to-train, and disaster response.
2. Investigate the impact of atmospheric conditions such as fog and rain on the performance of FSO links and develop techniques to mitigate their effects.
3. Analyze the system's performance using different measures such as received power, SNR, and BER.
4. Investigating and addressing the challenges associated with deploying and maintaining the optical wireless communication system in Smart Cities, such as power management, security, and resilience to environmental factors. By achieving these research goals, this research aims to provide a valuable contribution to the development of Smart Cities, enabling efficient and reliable communication between various devices and systems, and improving the quality of life for citizens

أهداف المجموعة
Group goals

The research group would likely engage in various activities to achieve their research goals. Some of these activities may include:

- Conduct a comprehensive review of the literature to identify and understand the current state of the art in optical wireless communication systems and Smart Cities Applications .
- Conduct field tests of the optical wireless communication system, to evaluate its performance under real-world conditions and identify any issues that may arise .
- Design mathematical models of free space optical link including straight and curved track geometries
- Analyze the results of the field tests and use this information to refine the design of the optical wireless communication system and improve its performance .
- Possibly, developing and evaluating protocols for the efficient and reliable transfer of data over the optical wireless communication system, considering the requirements and constraints of Smart Cities Applications .
- Collaborating with stakeholders in the Smart Cities ecosystem, such as city planners, policymakers, and technology providers, to ensure that the research is aligned with the needs and priorities of the community. Overall, the research group would engage in a range of activities to design and optimize an efficient and reliable optical wireless communication system for Smart Cities Applications, with the ultimate goal of contributing to the development of more sustainable and livable cities.

نشاط المجموعة
Group activity

المجموعة (٥٩)

Smart Power and Sustainable Energy Systems	اسم المجموعة Group Name
<ul style="list-style-type: none"> Fahad M. Almasoudi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Khaled S. Alatawi Husam S. Samkari Walaa R. Abd Elrahma 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Muhammad Tariq Nazir Muhammad Shoaib Bhutta Ghulam Rasool 	المشاركين من خارج الجامعة Group members from outside the university
This group research focuses on the issue of frequency control and stability of multi-terminal HVDC (MTDC) techniques for implementing large-scale Doubly-fed induction generator (DFIG) based offshore wind farms (OWFs) over long distances. Our aim is to design an effective control technique to enhance frequency stability and maximize the power generation in DFIG-based OWFs using a hybrid MT-HVDC (HMT-HVDC) system for large scale power transmission over long distances	الهوية البحثية للمجموعة Group identity
To overcome the limitation of integrating DFIG based OWFs with the HMT-HVDC systems such as challenges in reactive power injection, instability of the power system during voltage dips, low inertia and poor small-signal stability . • To propose a dynamic coordination control strategy for enhancing frequency stability of HMT-HVDC employing DFIG-based OWFs . • To accurately monitor and control stability of the frequency, voltage and phase of the output power of the DFIG for the protection of the HMT-HVDC system • To increase the availability of reactive power during fault occurrences without exceeding the operational limits of the DFIG . • To improve the integration of off-shore wind farms using hybrid MT-HVDC for large scale power transmission over long distances . • To accurately predict the wind speed of the OWFs using artificial intelligence-based prediction techniques .	أهداف المجموعة Group goals
<p>To develop a novel hybrid MT-HVDC approach known as (LCVSC-HVDC) which combines Line Commutated Converter (LCC) and Voltage Source Converter (VSC) for analyzing the frequency stability of the DFIG based OWFs .</p> <p>To address the issues of low inertia which increases the rate of frequency change which in turn affects the reliability of OWFs. • To develop an artificial intelligence based ANFIS model that will predict the wind speed and therefore will contribute to the system's stability. • To design a two stage control loop for improving the system's robustness against grid faults, variations in the wind speed and changes in the internal parameters of the DFIG</p>	نشاط المجموعة Group activity

المجموعة (٦٠)

Cancer Immunotherapy Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Almohanad Alkayyal 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Moham med Jalal Malik Altayar Nizar Saeedi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Antonio Chiocca Ahmad Bakur Mahmoud 	المشاركين من خارج الجامعة Group members from outside the university
Our research program focuses on developing cancer immunotherapies, which include engineering oncolytic viruses, checkpoint inhibitors, cell therapies, and cancer vaccines. Our aim is to develop novel treatments for breast, colon, and brain tumors. Currently, we are working on combining various experimental drugs to enhance the efficacy of the treatment.	الهوية البحثية للمجموعة Group identity
Invent and develop vaccines and cell-based therapies for the treatment of cancers.. Promoting a culture of innovation and creativity in the field of vaccines and immunotherapy. Technology transfer and localization for designing vaccines and immunotherapies. Ensure the sustainability of the research program through the development of the capacities and capabilities of faculty members and postgraduate students in the field of vaccines and immunotherapy.	أهداف المجموعة Group goals
<p>Developing oncolytic VSV virus platform for the treatment of breast and colon cancers. Developing Maraba virus platform for infectious disease vaccine uses .Identifying and exploring the oncolytic activities animal and plant viruses for as potential cancer therapeutics</p> <p>Developing CAR-T therapy for hematological malignancies</p>	نشاط المجموعة Group activity

المجموعة (٦١)

Hematological malignancies and genomic medicine group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammed Alasseiri 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Osama M. Al-Amer Abdullah Hamadi Waseem AlZamzami Sael Musallam Mohammad Alanazi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Haroon Khan 	المشاركين من خارج الجامعة Group members from outside the university
Our research group focuses, but not limited to, blood cancers, including leukemias, lymphomas, and myeloma. Currently, our research focuses on understanding the progression and identifying transcriptional and epigenetic vulnerabilities in hematological malignancies to develop new prognostic factors and novel therapeutic strategies for these diseases.	الهوية البحثية للمجموعة Group identity
Conduct fundamental translational medicine research in hematological malignancies. Develop novel prognostic factors and targeted therapies for hematological malignancies.. Invent sustainable programs to improve the capabilities in the field of translational medicine research.. Establish collaboration with private sector such as pharmaceutical and diagnostic companies.	أهداف المجموعة Group goals
<p>Our ongoing research focus on multiple areas in hematological malignancies based on the expertise of our members, such as:</p> <ul style="list-style-type: none"> • Molecular basis of resistance to chemotherapy and targeted therapies in hematological malignancies (Dr. Mohammed Alasseiri). • Molecular basis of leukemogenesis and lymphomagenesis (Dr. Osama Al-Amer). • Epigenetics and genome stability of hematological malignancies (Dr. Seal Alatawi). • Metabolism, cancer biology, stem cells, and p53 in hematological malignancies (Dr. Waseem AlZamzami) <p>Blood cells and microenvironment of hematological malignancies (Dr. Abdullah Aldhafri). • Immune signaling pathways of hematological malignancies (Dr. Mohammad Alanazi). <p>Group achievements Our group has a successful grants record. In the last two years, we received three intuitional research funds from the ministry of education. We recently registered three patents with the Saudi Authority for Intellectual Property with the following application numbers: 122440454, 123441100, and 123441212. In addition, we published many research papers in high-impact factor journals.</p> </p>	نشاط المجموعة Group activity

المجموعة (٦٢)

Molecular Therapy	اسم المجموعة Group Name
<ul style="list-style-type: none"> Kholoud Almasoudi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Eram Husain Mohammed Alnemari Ruqaiyah Bedaiwi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Ahlam Sultan Hanan Henidi Sheka Aloyouni Drazen Raucher 	المشاركين من خارج الجامعة Group members from outside the university
New frontiers for cancer therapy	الهوية البحثية للمجموعة Group identity
<p>1. To develop computational methods for the identification of peptides with a potential impact on cancer therapy.</p> <p>2. Utilization of artificial intelligence in the prediction of functional genes and proteins to fight colorectal cancer.</p> <p>3. To develop therapeutic peptides from microbial resources for the therapy of colorectal cancer.</p>	أهداف المجموعة Group goals
Development of computational methods to predict and identify functional regions of genes and proteins that impact cancer risk and therapy and testing them in wet lab research.	نشاط المجموعة Group activity

المجموعة (٦٣)

Fin-tech Research Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Imdadullah Hidayat ur-Rehman 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammad Nurul Alam Majed Alsolamy Saleh Hamed Alharbi Tawfeeq Mohammed Alanazi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Ziaur Rehman ABUL BASHAR BHUIYAN 	المشاركين من خارج الجامعة Group members from outside the university
Our research group focuses on FinTech developments and services generally and specifically in the context of Saudi Arabia. Some of these are listed below: 1. Green Finance and Its impacts on Sustainable Development 2. Innovation in financial services 2. Fintech Security 3. The role of robo-advisors in wealth management	الهوية البحثية للمجموعة Group identity
This study aims to achieve the following research objectives: 1. Exploring the key factors concerned to FinTech and sustainable development. 2. To propose models that describes the sustainable performance of financial institutions. 3. To carry out empirical evaluations to test and validate the proposed models. 4. To give recommendations based on the outcomes	أهداف المجموعة Group goals
<p>Idea Generation, • Design of Open-Ended Interview Questions • Conducting Interviews • Interviews Analysis • Survey Instrument Development</p> <p>Survey Data Collection • Survey data analysis • Report writing</p>	نشاط المجموعة Group activity

المجموعة (٦٤)

Eco-tourism	اسم المجموعة Group Name
<ul style="list-style-type: none"> Jamshid Ali 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Majed Alsolamy Khaled Alblowi Majed G. Alotaibi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Shahid Bashir 	المشاركين من خارج الجامعة Group members from outside the university
Development and implementation of the Eco-tourism scale and system in the Kingdom of Saudi Arabia	الهوية البحثية للمجموعة Group identity
To develop model for the eco-tourism regarding the contextual need of KSA, especially for its mega projects such as NEOM, Amala and RedSea. 2. To analyze the expected positive impacts of adopting eco-tourism system on community of Saudi Arabia, socially and financially. 3. To test the mediating impact of green logistics on the financial consequences of adopting eco-tourism system.	أهداف المجموعة Group goals
The entire project will be completed in total eight rounds. Among which, the first four rounds will clarify the intended meanings and breadth of the theoretical concepts. In the first and second round, the participants will be academicians and practitioners respectively. While choosing them, it will be ensured that; firstly, the academicians (or scholars) are from different countries whose area of interest is ecotourism, and whose research work in a similar context is already published in well-reputed journals; secondly, the practitioners will be from different countries, whose have at least five years of working experience as part of senior management team of a well reputed tourism company, and whose have at least two years of experience to handle eco-friendly packaged vacations. Through first and second round, the information will be gathered from at least 20 participants which is a good number for the most comprehensive assessments (Shetty, 2019). Based on information gathered, the conceptual definitions will be proposed along with interpretation of constructs, possible dimensions, and items	نشاط المجموعة Group activity

المجموعة (٦٥)

Green University Initiative (GUI) Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammad Nurul Alam 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Imdadullah Hidayat ur- Rehman Saleh Hamed Alharbi Tawfeeq Mohammed Alanazi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> NOWSHAD AMIN 	المشاركين من خارج الجامعة Group members from outside the university
Our research group focuses on Saudi Green Initiative that has budgeted 700 billion of US dollars on increasing Saudi Arabia's reliance on clean energy, offsetting emissions, and protecting the environment, in line with Vision 2030. It aims to improve quality of life and protect future generations. Our project is in line with this grand objective. The green University Initiative (GUI) will play a vital role in assessing the needs' assessment, importance, awareness, and development of action plan for engaging the community to impact the society at large	الهوية البحثية للمجموعة Group identity
A member of the UN General Assembly, the Kingdom of Saudi Arabia (KSA) seeks to be a forerunner in realizing sustainable development globally, starting from the Saudi society; given that the said SDGs go in harmony with the Saudi Vision 2030. The SDGs are linked with UT Green Campus Initiatives. Our research group aims to achieve the following goals; Goal 1: Take urgent action to combat climate change and its impacts in Saudi Arabia by creating green university adoption process Goal 2: Making UT a model for energy use and conservation Goal 3: Making UT a model for waste reduction and recycling Goal 4: Making UT a model for water management Goal 5: Making UT a model for travel and transport management Goal 6: Making the UT campus a model site for promoting biodiversity Goal 7: Making UT an internationally recognized center for promoting climate justice Goal 8: Using Green Chemistry at UT	أهداف المجموعة Group goals
Idea Generation and make a plan to achieve the goals • Design of Open-Ended Interview Questions • Conducting Interviews • Analysing the qualitative data • Design the quantitative study plan • Survey Instrument Development • Survey Data Collection • Survey data analysis Develop a general model of GUI adoption for all HEIs Report writing	نشاط المجموعة Group activity

المجموعة (٦٦)

Sustainable financing for clean energy and human health projects	اسم المجموعة Group Name
<ul style="list-style-type: none"> Bakhita Hamdow Gad Elkreem 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Faizah Asulami Mwahib Al seed Faiza Mohammed 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Sufian Mohamed Abdel- Gadir Tomader Gaber Elhassan 	المشاركين من خارج الجامعة Group members from outside the university
Business Sustainability	الهوية البحثية للمجموعة Group identity
<p>. Activating a culture of sustainable finance and responsible investment that considers environmental and social considerations when making investment decisions in financial institutions.</p> <p>Discover the financial challenges facing clean energy projects and innovate financing methods that can help in the development and sustainability of clean energy projects.</p> <p>Innovating financing methods that help sustainability of private health institutions</p> <p>Develop the research competencies of faculty members and students of the Department of Finance and Investment to ensure research sustainability</p>	أهداف المجموعة Group goals
<p>. Establishing the Sustainable Finance Platform in cooperation with some banks and financial institutions in Saudi Arabia Kingdom to study the opportunities and challenges facing financial institutions from sustainable finance practices.</p> <p>Publish research that adds innovative financial solutions that help in the development and sustainability of clean energy projects.</p>	نشاط المجموعة Group activity

المجموعة (٦٧)

Artificial intelligence in business	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammed Najim Alotaibi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Majed G. Alotaibi Jamshid Ali 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> David B. Grant Muhammad Asif Gondal 	المشاركين من خارج الجامعة Group members from outside the university
The main focus of the group's research to focus of application of AI in business transaction ,which related to different scope of business application.	الهوية البحثية للمجموعة Group identity
<p>The group goal of Artificial Intelligence (AI) in business is to leverage the power of this technology to increase efficiency and productivity. Some of the specific goals that businesses may have when implementing AI technology include:</p> <p>Automating repetitive tasks: AI can be used to automate tasks such as data entry, customer service, and scheduling, freeing up human employees to focus on more complex tasks.</p> <p>Improving decision-making: AI can analyze large amounts of data and provide insights that can help businesses make better decisions.</p> <p>Enhancing customer experience: AI can be used to personalize interactions with customers and provide faster, more accurate service.</p> <p>Increasing efficiency: AI can optimize processes and reduce waste, leading to increased efficiency and cost savings.</p> <p>Developing new products and services: AI can be used to identify market trends and develop new products and services that meet customer needs.</p> <p>Overall, the goal of AI in business is to drive growth and competitive advantage by leveraging the power of technology to improve operations, better understand customers, and innovate faster.</p>	أهداف المجموعة Group goals
Diversity of the group member majors background will enhanced the research from different perspectives.	نشاط المجموعة Group activity

المجموعة (٦٨)

Smart systems based on artificial intelligence strategies in serving engineering problems and community development	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mansoor Alghamdi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sami Mnasri Malek Alrashidi Ibrahim Alkhazi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Majed Alroaily Nan Yang Chrles Z. Liu 	المشاركين من خارج الجامعة Group members from outside the university
In the real world, especially in industrial areas such as transportation, telecommunications, or energy management, the problems are large and complex. What makes them difficult to solve, even if their definition is often easy. Optimization, part of operational research, associated with machine learning paradigms are the axes of research, dealing with this type of problem. According to the Saudi 2020, and 2030 visions, there are and will be numerous mega projects such the futuristic mega-city of Neom, among many other projects that extensively uses artificial intelligence and information technology. This yields and deals with predicting and learning needs which is a gold mine for the decision makers, who control these mega projects. This type of research opens a research line for enhancing the performance of data classification and learning, allowing for better and roust solution compared to traditional approaches, which are found useless and inapplicable, particularly if we are talking about real-time systems, that need prompt decisions.	الهوية البحثية للمجموعة Group identity
Design and develop intelligent systems to solve real-life problems. Employing artificial intelligence techniques and algorithms such as machine learning, deep learning, and blockchain technologies, to solve complex engineering problems and others related to the development and solution of local community problems. This includes the Internet of Things smart networks, smart cities, data routing, pattern recognition and computer vision.	أهداف المجموعة Group goals

Artificial intelligence and its technologies are among the activities of the research group that are compatible with the identity of Tabuk University (environmental technology) and national priorities (environmental sustainability and basic needs), where coordination can be made with some beneficiary entities such as the Center for Artificial Intelligence and Sensor Technologies. Some other activities that could be applications of the proposed intelligent predictive algorithms are as follows: Management of health crises and epidemic diseases, analysis, and interpretation of common genetic diseases in the Tabuk region: in accordance with the identity of Tabuk University (medical technology) and national priorities (human health), where coordination can be made with some beneficiary entities such as the Prince Fahd bin Sultan Chair for Medical Research. - Proactive management of risks by improving awareness of the cyber situation: in line with national priorities (future economies), where coordination can be made with some beneficiary entities such as the NEOM project. - Forecasting fruit production through drones (as well as irrigation and product safety): in line with the identity of the University of Tabuk (environmental technology) and national priorities (environmental sustainability and basic needs), where coordination can be made with some beneficiary entities such as the Astra Agricultural Company. - Strategies for monitoring and improving birds, the ecosystem, afforestation, and the marine environment: in accordance with the identity of the University of Tabuk (environmental technology) and national priorities (environmental sustainability and basic needs), where coordination can be made with some beneficiary entities such as the Red Sea International Company. - Sustainable management of water resources: in line with the identity of the University of Tabuk (environmental technology) and national priorities (environmental sustainability and basic needs), where coordination can be made with some beneficiary entities such as the Center for Renewable Energy and Environmental Technologies.

نشاط المجموعة Group activity

المجموعة (٦٩)

On the interest of IoT and augmented reality on interactive communicant environments (such as learning and urban planning contexts in smart cities).	اسم المجموعة Group Name
<ul style="list-style-type: none"> Malek Alrashidi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sami Mnasri Mansoor Alghamdi Ibrahim Alkhazi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Thierry Val Majed Alroaily Nan Yang Charles Z. Liu 	المشاركين من خارج الجامعة Group members from outside the university
<p>This research group highlights the interest of applying new emerging technologies such as the Internet of Things and Augmented reality in numerous domains such as e-learning and deaf learning. The IoT refers to technological advancements in computer networking using real-world connected objects which communicate with each other over the Internet. The IoT and AR have greater potential to remove all barriers in education and any interactive communication environment.</p> <p>The research group aim to answer the following research questions:</p> <ul style="list-style-type: none"> In what ways can we encourage learners' communication and social integration through appropriation? What are some practical applications of IoT and AR technology and how are they utilized by individuals? To what extent does a learner's identity contribute to the ways in which they use IoT and AR technology in social contexts? How does the use of IoT and AR fit into everyday communication practices for both learners and users? 	الهوية البحثية للمجموعة Group identity

The overall goal is to design and develop intelligent systems to solve real-life problems.

Most previous studies evaluating the effectiveness of IoT and AR technology rely solely on theoretical hypotheses or simulations, particularly for complex engineering problems. Our research group aims to innovate this approach by conducting real empirical experiments utilizing a prototype for learning contexts and scenarios. By utilizing algorithms based on practical measurements and hypotheses, our goal is to provide tangible proof for the effectiveness of IoT and AR techniques in addressing complex engineering challenges.

Through implementing real-life experimental tests, this project can be applied to any IoT network within universities, companies, or cities. Apart from learning, this prototyping can be extended to resolve various issues in the IoT-AR context, such as managing energy consumption. Additionally, it could be applied to tackle engineering problems in the NEOM project, which encompasses enhancing energy efficiency, managing transportation, and planning urban structures. To evaluate the performance of this approach in NEOM, we can use a map of the area to identify the optimal configuration providing coverage for the region while considering its unique geographic features and obstacles.

أهداف المجموعة Group goals

A research study has been published in the context of the research group's activity, entitled:

Alrashidi, M. Synergistic integration between internet of things and augmented reality technologies for deaf persons in e-learning platform. J Supercomput (2022). <https://doi.org/10.1007/s11227-022-04952-z>

Artificial intelligence and its technologies are among the activities of the research group that are compatible with the identity of Tabuk University (environmental technology) and national priorities (environmental sustainability and basic needs), where coordination can be made with some beneficiary entities such as the Center for Artificial Intelligence and Sensor Technologies.

Some other activities that could be applications of the Internet of Things and augmented reality are as follows:

- Sensors and sensor networks: in line with the identity of Tabuk University (environmental technology) and national priorities (environmental sustainability and basic needs), where coordination can be made with some beneficiary entities such as the Center for Artificial Intelligence and Sensor Technologies.

- Smart grids: in line with the identity of the University of Tabuk (environmental technology) and national priorities (leadership in energy and industry), where coordination can be made with some beneficiary entities such as the Center for Renewable Energy and Environmental Technologies.

- Internet of Things: in line with national priorities (future economies), where coordination can be made with some beneficiary entities such as telecom companies in Tabuk.

- Sustainable management of water resources: in line with the identity of the University of Tabuk (environmental technology) and national priorities (environmental sustainability and basic needs), where coordination can be made with some beneficiary entities such as the Center for Renewable Energy and Environmental Technologies.

**نشاط المجموعة
Group activity**

المجموعة (٧٠)

Common genetic diseases research in the Tabuk region	اسم المجموعة Group Name
<ul style="list-style-type: none"> Shereen Fawzy Ibrahim 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mansour Ahmed Al-Anzi Murad Abdul Rahim Younes Hanan Abdel Wahab Al-Sayed 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Samiha Hamdy Ramadan Rana Abdul Rahman Al-Rawashed Noor saadah bachok 	المشاركين من خارج الجامعة Group members from outside the university
The research program focuses on finding a hybrid system that connects artificial intelligence with the medical sector to facilitate the diagnosis of epilepsy by integrating several algorithms to reach. The best results and their translation into an innovative EpiTech device using health informatics	الهوية البحثية للمجموعة Group identity
<p>1- Raising the quality of life of people with epilepsy by facilitating accurate diagnostic methods.</p> <p>2- Assisting medical care providers in developing medical decision-making methods and predicting future cases.</p> <p>3- Promoting innovation in the field of artificial intelligence.</p> <p>4- Improving the devices and tools used for diagnosis.</p> <p>5- Ensuring the sustainability of the research program at the University of Tabuk by developing the skills of faculty members.</p> <p>6- Reducing time and effort on medical staff and patients by simplifying diagnostic procedures.</p> <p>7- Contribute to alleviating the financial burdens and expenditures of the health sector and applying a culture of efficient spending.</p>	أهداف المجموعة Group goals

- 1- Work on creating many machines learning algorithms and applying them to contribute to the diagnosis of epilepsy.
- 2- Work on designing systems capable of diagnosing epilepsy and predicting the occurrence of the disease.
- 3- Work on programming systems using special programming languages.
- 4- Work on testing these systems using real laboratory samples.
- 5- Comparing these systems with previous systems and knowing their efficiency.
- 6- Working on creating an EpiTech electronic device capable of translating brain signals and giving medical decisions without human intervention.

نشاط المجموعة Group activity

المجموعة (VI)

Infection, Phytomedicine and its therapeutics applications	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohammad Zubair 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Marai Almari Shamina Begum Amerah Mahdi Odeh Alatawi Faris Hashem Uzma Faridi Fayez M Saleh 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> niasuH doobaM dahoF nahK fatIA damhA labql 	المشاركين من خارج الجامعة Group members from outside the university
<p>Our research group will work on the prevalence of infection type in DFI and will work on the extraction from the medicinal plants of Saudi Arabia. Our main aim to green synthesizes the nanoparticles from these plants and use against the infectious agents causing infections in DFI. Our aim to develop a novel product that will help in controlling the MDR infection. We already bio fabricated the Titanium Oxide Nanoparticles from Ochradenus arabicus and tested against biofilm positive Pseudomonas and S aureus which was published as First report in Q1 ranked journal</p>	الهوية البحثية للمجموعة Group identity

Goal 1: Green synthesis and characterization of various plant extracts of medicinal origin. Approach: Several plants (approximately 30-50 medicinal plants) will be screen for their ability as antibiotic potency against the bacteria from diabetic foot origin. The plants will be selected based on their medicinal origin and ethnopharmacological usage. The advantage of using medicinal plants is that the active phytoconstituents of the plant extract will enhance the antimicrobial and antibiofilm potency. The extracts will be then characterized using an array of state of the art spectroscopic and microscopic techniques. This will enable us to explore and explain the detailed physicochemical properties of the extracts.

Goal 2: In vitro synthesis and characterization of nanocomposite using polysaccharide. Approach: The nanocomposite will be prepared using earlier characterized nanoparticles. The films will be then characterized for physical and chemical properties such as thickness, moisture content, solubility, absorption, tensile strength etc. These properties are important to study the attributes that govern the microbial growth and intensity of wound infection

Goal 3: Antibiofilm efficacy of the plant extracts against bacterial pathogens associated with diabetic foot ulcer/infections. Approach: The reference bacteria associated with diabetic foot will be selected for such studies. The detained antibiofilm potency of the extracts will be carried out. It will be kept in mind that all doses will be selected below the sub-inhibitory concentrations. The use of inhibitory concentration will pose the risk of development of antimicrobial resistance. The microscopic analysis of the biofilms using latest microscopic tools such as confocal laser microscope, electron microscope etc. will also be performed to decipher the effect of various extracts on the architecture of biofilms.

Goal 4: Inhibition of quorum sensing controlled virulence factors of the bacteria by various medicinal plant extracts of Saudi Arabian region.

Approach: The most important virulent traits of the bacteria will be assessed in this objective. The bacteria will be grown in the absence and presence of extracts, and the virulence factors will be assessed. The motility, exoprotease production, elastases production, rhamnolipids, virulent pungent etc will be assessed at the subinhibitory concentrations

To synthesize the characterized the various plants extracts of medicinal origin of Saudi Arabia. 2. To study the role of extracts, its various constituents, and antimicrobial sensitivity and effect of extracts on MDR of diabetic foot origin. 3. Antibiofilm efficacy of the medicinal plants extract against bacterial pathogens associated with diabetic foot ulcer/infections. 4. Inhibition of quorum sensing controlled virulence factors of the bacteria by various medicinal plant extracts of Saudi Arabian region.

أهداف المجموعة Group goals

نشاط المجموعة Group activity

المجموعة (٧٢)

Geriatrics and palliative medicine research group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Afaf Abdullah Albalawi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Murad Abdul Rahim Younes Mohammad Alotaibi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mahmoud Albarbari Tahani Almofeed Altamimi Christina Prather 	المشاركين من خارج الجامعة Group members from outside the university
<p>The research program focuses on health and diseases in older adults, the factors that help improve the quality of life for this age group and for patients diagnosed with an incurable terminal illness. We aim to study new interventions for age-related conditions, health issues facing the older population, and health changes over the lifespan that affect the prospects for health aging. We also focus on the risk factors that lead to increased suffering in the elderly and those living with serious medical conditions and finding ways and solutions to avoid them. It is also possible to cooperate with other departments such as the Robotics and Artificial Intelligence Center to activate technology to serve this precious category of society.</p>	الهوية البحثية للمجموعة Group identity
<p>1. Improving medical practices and services that care for the elderly and patients with incurable diseases.</p> <p>2. Raising the level of research in the field of healthy aging and the factors leading to it, which contributes to creating an effective segment of older adults in society.</p> <p>3. Raising the level of research in the field of geriatrics/palliative medicine in the Kingdom of Saudi Arabia, whether for the elderly or for those who have life-threatening conditions that cannot be acquitted.</p> <p>4. Benefiting from the services of the Robotics and Artificial Intelligence Center in the future, which may help reduce the cost of services provided to this part of society.</p> <p>5. Developing the capabilities and competencies of doctors in the specialty of the elderly and palliative therapy.</p>	أهداف المجموعة Group goals

1. Efficacy and tolerability of selective serotonin reuptake inhibitors and its impact on the quality of life of older adults
2. The impact of antidepressants on the quality of life of older adults.
3. Designing smart shoes for older adults to support prevention, diagnostic work-up, therapeutic decisions, and individual disease monitoring with continuous assessment of gait and mobility.
4. Prognostic predictors of mortality in people living with advance dementia
5. Prescription monitoring and reporting system for controlled substances.

نشاط المجموعة
Group activity

المجموعة (٧٣)

Application of Nanotechnology for Treating Neurodegenerative Diseases Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Abdullah Alattar 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Reem Alshaman Mohamed Samir Abdel-Maksoud 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Dong Liang Fawad Ali Shah Alam Zeb 	المشاركين من خارج الجامعة Group members from outside the university
Our research interest focuses on developing nanoformulations of anti-inflammatory agents for protection against neurodegenerative diseases including Alzheimer's disease, Parkinson's disease, Huntington disease and others. We aim to develop new therapeutic tools for preventing the progressive nature of these chronic diseases. Currently, we are working on using anti-inflammatory and immunomodulatory agents, such as Carveol, Melatonin and others, prepared in nanoformulations to enhance their absorption and pharmacokinetics and hence their biological activities.	الهوية البحثية للمجموعة Group identity
<p>Develop novel nanoparticle preparations of anti-inflammatory and immunomodulatory agents.</p> <p>Testing the efficacy of the nanopreparations of the selected anti-inflammatory and immunomodulatory agents.</p> <p>Compare the efficacy and biological activities of the nanopreparations of the anti-inflammatory and immunomodulatory agents with those produced in their free form.</p> <p>Maintain a sustainable research group through improving the knowledge of the faculty members and students about the usefulness of nanotechnology in preparing anti-inflammatory agents and the putative efficacy in halting the progression of neurodegenerative diseases.</p>	أهداف المجموعة Group goals
<p>Formulation of nanoparticle preparations of anti-inflammatory and immunomodulatory agents to enhance their physical characteristics.</p> <p>Apply these nanopreparations in animal models of neurodegenerative diseases to test their efficacy.</p> <p>Identify the role of the selected anti-inflammatory agents in protection from neurodegenerative diseases induced in rodents.</p> <p>Suggesting new therapies to be further tested in animal and human studies.</p>	نشاط المجموعة Group activity

المجموعة (٧٤)

Development of novel nanopreparations of antioxidants for protection from cardiovascular diseases." Group"	اسم المجموعة Group Name
<ul style="list-style-type: none"> Reem Alshaman 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sawsan Zaitone Amira Hamed Eltrawy Sadeem Fahad Elharbi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Eman A.M. Toraih 	المشاركين من خارج الجامعة Group members from outside the university
This research program is interested in development of new treatment strategies for cardiovascular diseases and toxicities such as diabetic cardiomyopathy, heart failure or drug induced cardiac hypertrophy and fibrosis. Our group thinks that utilizing nanopreparations of novel antioxidants will improve their physical characters and activity.	الهوية البحثية للمجموعة Group identity
<p>We aim to develop nanopreparations of novel antioxidant agents selected from the nature to improve their activity and to testing the utility of these nanopreparations in protecting from cardiovascular disease; this will be evaluated through assessment of the cardiac function and biological markers of cardiac diseases.</p> <p>We aim also to keep a sustainable research group through improving the knowledge of the faculty members and students about cardiovascular diseases and the usefulness of nanotechnology in enhancing the putative efficacy of antioxidants in protection from cardiovascular diseases.</p>	أهداف المجموعة Group goals
<p>Preparation of novel antioxidant agents in form of nanoparticles and determination of their physical characters.</p> <p>-Applying these nanopreparations of antioxidants in protecting experimental models of cardiovascular disease through assessment of the function and biological indicators.</p> <p>-Comparing the efficacy of the nanopreparations of antioxidants with the efficacy of the free antioxidants to set a fair comparison and decision about the success of our theory.</p>	نشاط المجموعة Group activity

المجموعة (٧٥)

<p>Novel Therapies for Chronic Hepatic Diseases and Hepatic Fibrosis" Group"</p>	<p>اسم المجموعة Group Name</p>
<ul style="list-style-type: none"> Sawsan Zaitone 	<p>رئيس المجموعة Principle investigator</p>
<ul style="list-style-type: none"> Abdullah Alattar Rehab Ahmed Sara Alsharief 	<p>المشاركين من منسوبي الجامعة Group members from the university</p>
<ul style="list-style-type: none"> Emad Kandil Magdy Elnashar 	<p>المشاركين من خارج الجامعة Group members from outside the university</p>
<p>The liver removes toxins from the body's blood supply and performs hundreds of other vital functions.</p> <p>This group is interested in finding novel therapeutic options for hepatic illnesses with a focus on chronic liver diseases such as fatty liver and liver fibrosis as well as numerous possible toxicities induced by drugs or pollutants.</p> <p>This group targets the pathophysiology of hepatic illnesses and designs trials to protect against which and downregulate the disease progression by using natural compounds or natural oils. An additional focus is the formulation of dosage forms in the nanoscales that have promise to treat hepatic illnesses.</p>	<p>الهوية البحثية للمجموعة Group identity</p>
<p>Suggesting novel therapeutic options for treating hepatic illnesses from natural sources.</p> <p>Development of novel preparations of the selected natural remedies in the nanoscale.</p> <p>Testing the efficacy of these novel preparations in protection from hepatic illnesses induced by dietary factors such as high fat diet, exposure to drugs or environmental pollutants.</p> <p>Comparing the efficacy and biological activities of the nanopreparations of the nanopreparations of the selected natural remedies with those produced by the free forms of the same remedies.</p> <p>Sustaining a viable research group that enforces values and improves the knowledge with the faculty members and students in the University of Tabuk and held lectures and events to increase awareness about hepatic diseases.</p> <p>Finally, determining the usefulness of nanotechnology in preparing dosage forms of natural remedies and concluding about the putative efficacy in halting the progression of hepatic illnesses.</p>	<p>أهداف المجموعة Group goals</p>

Formulation of nanoparticle preparations of natural remedies to enhance their physical characteristics.

Applying these nanopreparations in animal models of hepatic illnesses to test their efficacy.

Identifying the role of the selected remedies in protection from hepatic illnesses induced in rodents.

Suggesting new therapies to be further tested in animal and human studies.

نشاط المجموعة
Group activity

المجموعة (٧٦)

Gram Negative Bacteria research group (GNB research Group)	اسم المجموعة Group Name
<ul style="list-style-type: none"> Rehab Ahmed 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Hanan Alshareef Tarig M. S. Alnour Eltayib Ahmed 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Nada A. Fadul Thamer A. Alenazi Maryam S Bin Shaman 	المشاركين من خارج الجامعة Group members from outside the university
<p>Our research focuses in the field of Antimicrobial resistance (AMR) especially resistance in gram negative bacteria which is responsible of the majority of the deadly AMR.</p> <p>Now we focus on learning about the level of resistance and mechanisms (know how) utilized by these bacteria to resist antibiotics. We are working to make data pertaining to resistance available publicly so that authorities, stake holders and researchers in the country and others related entities could use it efficiently.</p> <p>We are working to find and identify phages from the nature in Tabuk to help combat these resistant bacteria</p>	الهوية البحثية للمجموعة Group identity
<p>Our aims are:</p> <p>Enhance the collaboration between academia and healthcare in Tabuk area with regard to antimicrobial resistance(AMR).</p> <p>Develop evidence based strategies to deal with the global problem of AMR.</p> <p>Strengthening research capacity at the university of Tabuk in terms of knowledge and skills related to the field of AMR.</p> <p>Develop capacity for phage research and therapy.</p>	أهداف المجموعة Group goals
<p>Our research activities are:</p> <p>Evaluate the level of antimicrobial resistance in Gram negative at clinical level</p> <p>Explain mechanisms of antimicrobial resistance in Gram negative at molecular level</p> <p>Explore and identify phage therapy for resistant bacteria.</p> <p>Contribute to the antimicrobial stewardship and policies that aims to control resistant bacteria especially (GNB)</p>	نشاط المجموعة Group activity

المجموعة (٧٧)

The Medicinal Chemistry Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Kamel Metwally 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Nader Abo-Dya Ramadan Ali 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Dimitris Kletsas Mahmoud Soliman 	المشاركين من خارج الجامعة Group members from outside the university
The group focuses on drug design, drug synthesis, and drug delivery of novel anticancer and antimicrobial drugs	الهوية البحثية للمجموعة Group identity
<p>Discovery and development of novel anticancer agents</p> <p>Discovery and development of novel antimicrobial agents</p> <p>Development of novel anti-virulence agents.</p>	أهداف المجموعة Group goals
<p>Computer-aided drug design of novel anticancer and antimicrobial agents.</p> <p>Synthesis of the most promising designed drug candidates.</p> <p>Biological evaluation of the synthesized drugs.</p> <p>Formulation of the most active drug candidates.</p>	نشاط المجموعة Group activity

المجموعة (٧٨)

Biopolymer dressings for diabetic wound healing	اسم المجموعة Group Name
<ul style="list-style-type: none"> Ayman Salama Mohamed Grawan 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Ghareb Soliman Mona Kamel Eed Qushawy Saleh F. Alqifari 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mahmoud Elsabahy Khalid Mohamed Mohamed El-Say Rahaf F. Aldawish 	المشاركين من خارج الجامعة Group members from outside the university
Our research program focuses on developing a new pharmaceutical product containing insulin and other wound-healing agents for diabetic wound healing.	الهوية البحثية للمجموعة Group identity
<p>Developing a new pharmaceutical product for diabetic wound healing.</p> <p>Promoting a culture of innovation and creativity in the field of application of nanotechnology for wound healing.</p> <p>Identifying a new formulation for treatment of diabetic wounds.</p> <p>Improve diabetic patients quality of life through innovative wound healing product.</p>	أهداف المجموعة Group goals
<p>Preparation of insulin loaded nanoparticles and study their characteristics.</p> <p>Fabrication and characterization of wound healing dressing with insulin nanoparticles mixed with other wound healing agents from natural sources.</p> <p>In vivo study to evaluate the prepared nanoparticles against diabetic wounds.</p> <p>Transforming the prepared dressing into economically feasible products.</p>	نشاط المجموعة Group activity

المجموعة (٧٩)

Application of nanotechnology for management of skin aging	اسم المجموعة Group Name
Ghareb Soliman	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Ayman Salama Grawan Mona Kamel Eed Qushawy Nehal Mohsen Elsherbiny Kousalya Prabahar Kaliamoorthy 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Dong Liang Gamal Abdelghany Shazly 	المشاركين من خارج الجامعة Group members from outside the university
Development of nanoparticles containing drugs from synthetic and natural sources for treatment of skin disorders associated with aging process.	الهوية البحثية للمجموعة Group identity
<p>Development of nanoparticles loaded with pharmaceutical agents for the treatment of skin aging.</p> <p>Promoting a culture of innovation and creativity in the field of application of nanotechnology for solving skin problems.</p> <p>Identifying new nanoparticle formulations loaded with natural substances for treatment of skin aging.</p> <p>Ensure the sustainability of the research program through the development of the capacities and capabilities of faculty members.</p>	أهداف المجموعة Group goals
<p>Preparation of nanoparticles loaded with antioxidants and studying their characteristics.</p> <p>Preparation of nanoparticles loaded with natural products with reported anti-aging efficacy and studying their characteristics.</p> <p>Testing the prepared nanoparticles in vivo using experimental animal models of skin aging.</p> <p>Transforming the prepared nanoparticles into economically feasible products.</p>	نشاط المجموعة Group activity

المجموعة (٨٠)

Combined Antioxidants/Physical and Mental Activities for Attention Deficit Hyperactivity Disorder (ADHD) “ Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> • Hebatallah Hussein Attia 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> • Salwa Fares Ahmed • Ohoud Salem Alshehri 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> • Eman A.M. Toraih 	المشاركين من خارج الجامعة Group members from outside the university
<p>Attention Deficit Hyperactivity Disorder (ADHD) is a neurobehavioral problem frequently reported in children. It is associated with learning disorder, inappropriate degrees of impulsiveness and hyperactivity. In Saudi Arabia, the prevalence of ADHD between ages 4 to 17 is alarming and more than 15 %, which imposes great psychic and economic burdens on many of Saudi families as well as health care institutions. Cognitive engagement and physical activities have been associated with decreased risk of neurodegenerative disease.</p>	الهوية البحثية للمجموعة Group identity
<p>Evaluation of the potential neuroprotective effects of antioxidants/ Physical and Mental Activities and/or their selected combination on ADHD induced in rat model.</p> <p>Proposing novel therapeutic options for treating ADHD.</p> <p>Supporting a group that imposes knowledge within the faculty members about ADHD/</p>	أهداف المجموعة Group goals
<p>Induction of ADHD by oral consumption of monosodium glutamate.</p> <p>Physical and Mental Activities and/or their selected combinations will be applied in the rat model of ADHD.</p> <p>The impact of these manipulations will be assessed by animal behavior tests, measuring brain neurotransmitters, biochemical changes in the brain monoamines, oxidative stress, pro-inflammatory cytokines, and apoptosis. Moreover, brain histopathological examinations will be performed to ascertain the pathological changes and putative improvements by the selected modalities.</p>	نشاط المجموعة Group activity

المجموعة (أ)

Digital medication adherence technologies (DMATs) research group	اسم المجموعة Group Name
Palanisamy Amirthalingam	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Yasser Alatawi Narmatha Chellamani Ahmed Aljabri Saleh F. Alqifari Mostafa Ali 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Muralikrishnan Dhanasekaran Vasudevan Mani 	المشاركين من خارج الجامعة Group members from outside the university
Our research group aims to develop an intelligent system that help the patients to adhere their medication regimens. Currently, we are assessing medication adherence among people from different socioeconomic backgrounds and assessing potential cost-effective technology to improve medication adherence.	الهوية البحثية للمجموعة Group identity
<p>To develop and validate digital medication adherence technologies (DMATs) to improve the medication adherence.</p> <p>To improve the patient outcomes by integrating DMATs into the health care system.</p> <p>To establish an innovative approach of a multidisciplinary team to improve medication adherence in various healthcare settings.</p> <p>To develop the research capabilities of the research team in the field of digital health technologies through the continuous participation of research team members.</p>	أهداف المجموعة Group goals
<ol style="list-style-type: none"> 1. Assess the level of medication adherence and other related factors among various populations. 2. Develop and validate novel DMATs (hardware and software). 3. Integrate developed digital medication adherence technologies into healthcare practices. 	نشاط المجموعة Group activity

المجموعة (٨٢)

Investigation of bioactive substances for industrial use	اسم المجموعة Group Name
<ul style="list-style-type: none"> Amira Hajri 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sana Ahmad Khali Amna Alharbi Roa'a Saleh Hussein Almahlawi Shareefa Alshareef 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Ibrahim Sayed Mohammed Hussein Hatem Majdoub 	المشاركين من خارج الجامعة Group members from outside the university
Our research group focuses on the production and the use of valueadded components obtained from microalgae with potential application in the pharmaceutical and medical as well as for bioremediation. Moreover, this work will discusses the advantage, potential new beneficial strains, applications, limitations, research gaps and future prospect of algae from Saudi seaweed in industry.	الهوية البحثية للمجموعة Group identity
<p>The main goals are: 1. To valorize the products of the Saudi biomass. 2. To replace molecules widely used in the medical field and which have side effects on the human being with natural products. Heparin, for example, in addition to its multiple undesirable effects (bleeding, thrombocytopenia, and more rarely, osteoporosis), is industrially extracted from pig intestine. 3. To focus on natural products extracted from brown algae and which have the same anticoagulant effect as other synthetic anticoagulants. Our attention will particularly focused on some brown algae (Padina pavonica, Sargassum latifolium, Cystoseira myrica,...)</p>	أهداف المجموعة Group goals
Extraction and isolation of bioactive substances. 2. Identifying and exploring biological properties such as anticoagulant activity, analgesic activity, anti-inflammatory activity and gastroprotective activity.. 3. Exploring new potential beneficial strains, for future prospect of microalgae in industry	نشاط المجموعة Group activity

المجموعة (٨٣)

A mathematical analysis of Epidemic models by using fractional calculus	اسم المجموعة Group Name
<ul style="list-style-type: none"> Mohamed Ahmed Barakat Ahmed 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Ahmed Khalf Mousa Sayed Mesfer Mathematics Hayyan Alqahtani 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Hassen Aydi Abd-Allah Hyder 	المشاركين من خارج الجامعة Group members from outside the university
<p>Our group shall examine the analysis of several medical mathematical models, such as epidemic models. Epidemic models are useful tools for predicting the dynamics and control of a wide range of communicable diseases. These models are typically made up of nonlinear differential equations that describe the dynamics of the pattern of symptoms. To investigate the most effective ways for managing these epidemic infections in different parts of the world, a number of transmission models and possible controlling tactics have been devised.</p>	الهوية البحثية للمجموعة Group identity
<p>Introducing new some preliminary facts, viral definitions, theoretical results, and descriptions of the fractional HIV and COVID-19 models. • Establishing the Volterra integral equation's relationship to the suggested models. • Using the principles of Banach's fixed point theorem and Lareynonlinear Schuader's alternative, these models may be used to investigate the existence and uniqueness of solutions. • Studying and analyzing the properties and effectiveness of extended integral operators via the fundamental theories of functional analysis to the given models. • Providing Ulam's stability of the proposed models in the frameworks of Ulam-Hyers, generalized Ulam-Hyers, Ulam-HyersRassias, and generalized Ulam-Hyers-Rassias. • Illustrating the theoretical results by using the general numerical scheme and numerical simulations.</p>	أهداف المجموعة Group goals

Our group activity will focus on extending some new general fractional differential and integral operators for these Epidemic models. Also, Banach's and Leray-Schauder nonlinear alternative fixed point theorems will be used to analyze the existence results for these fractional-order models. Moreover, we setup modern strategies for solving the nonlinear differential equations in the sense of generalized fractional derivatives. In addition, for these provided models, we will develop several forms of Ulam's stability results. Also, to investigate the approximated solution and dynamical behavior of the models under study, suitable numerical techniques will be used. Finally, some comparisons with the past works and graphical interpretations for the acquired results will be given in details.

نشاط المجموعة Group activity

المجموعة (٨٤)

Developing new fluorosensor for the detection of PAHs in marine water.	اسم المجموعة Group Name
<ul style="list-style-type: none"> Sahr Alsherari 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Sana Ahmed Khalil Ali Rasha Mohammed Almostfa Hassan Majed Almorwan Hechmi SHILI Ali Molahi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Haitham Aljehdali Noureddine Raouafi 	المشاركين من خارج الجامعة Group members from outside the university
Our research program focuses on developing new fluorosensor for the detection of PAHs in marine water. We will develop a compact and light-weight fluorosensor, which will provides high-quality fluorescence spectra Our fluorosensor, will be carried by a commercial drone that will illustrates how airborne remote sensing based on fluorescence can be made cost-effective and readily applicable.	الهوية البحثية للمجموعة Group identity
Invent and develop an efficient and effective method to qualitatively/quantitatively analyzes the effects of PAHs on fluorescence spectroscopy of oil. - Develop new fluorosensor sensors with high accuracy and selectivity to detect and monitor oil spill. - To mount the suitable sensor capable of detecting oil.	أهداف المجموعة Group goals
Green Sonochemical modification of sensor 2- Full characterization of the cyclic modified cellulose utilizing various instrumental techniques such as FTIR, NMR, XRD, TGA, SEM-EDX in addition to XPS spectra. 3- Fluorescence sensing of Polycyclic Aromatic Hydrocarbons 4- Detection Optical study using UV-Visible and Fluorescence spectroscopy. 5- Analysis, configuration and optimization of analytical and experimental results for proper evolution of our system.	نشاط المجموعة Group activity

المجموعة (٨٥)

Environmental & Natural Products	اسم المجموعة Group Name
• Marzough Aziz Albalawi	رئيس المجموعة Principle investigator
• Amira Khalifa Hajri	المشاركين من منسوبي الجامعة Group members from the university
• Bassem Jamoussi • Hedi Ben Mansour	المشاركين من خارج الجامعة Group members from outside the university
Considering the continual production of PhACs, this group will comprehensively study the pharmaceuticals commonly detected in hospital effluents (HEs) in Tabuk region and their adverse environmental effects. Will focus also on the advances in bioremediation technologies, which can reduce unprocessed pharmaceuticals released via effluent into the environment	الهوية البحثية للمجموعة Group identity
Study the efficiency of conventional wastewater treatment plants in removing emerging micropollutants. 2. To reduce environmental hazards from hospitals effluents. 3. Investigating the development of an innovative system based on the valorization of natural product in the treatment of hospital effluents.	أهداف المجموعة Group goals
1. Identification of PhACs in Tabuk region that require greater attention due to their risks to the environment and human health. 2. Establishing new optimized system based on the valorization of natural product in the treatment of hospital effluents. 3. Extrapolate the collected results to the pilot scale.	نشاط المجموعة Group activity

المجموعة (٨٦)

Smart materials	اسم المجموعة Group Name
<ul style="list-style-type: none"> Aisha Nawaf Albalawi 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Marzogh Aziz Albalawi Mohammed Hassan Alnemari Mazen A. Alsolami Jayda Gomaa Eldiasty Hamada Mohamed Abdelfattah Ibrahim 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Fuad Ameen Susana Rodriguez-Couto 	المشاركين من خارج الجامعة Group members from outside the university
Design and optimization of new materials: AI can be used to predict the properties of materials based on their chemical composition and structure. This can help in the design of new materials that have desired properties, such as strength, durability, and biodegradability. AI algorithms can also be used to optimize the processing conditions of materials, such as temperature and pressure, to enhance their properties.	الهوية البحثية للمجموعة Group identity
1-Identification of new materials: AI can be used to screen large databases of materials to identify new materials with desirable properties. Machine learning algorithms can be trained to identify patterns in the data and predict which materials are likely to have certain properties. This can help in the discovery of new materials that are more 2-Microbial synthesis of novel nanoparticles combination with antibiotics for improved antimicrobial activity and cytotoxicity evaluation.	أهداف المجموعة Group goals
Development some material which friendly of environment	نشاط المجموعة Group activity

المجموعة (٨٧)

: Environmental Stress and Sustainable Crop Production Group)	اسم المجموعة Group Name
• Mohammad Nasir Khan	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> • Mazen A. AlSolami • Khalaf M. Alhussaen • Zahid H. Siddiqui 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> • Manzer H. Siddiqui • Francisco J. Corpas 	المشاركين من خارج الجامعة Group members from outside the university
<p>The research group is planned to develop tolerance within economically important crop plants against environmental stresses. These stresses include drought stress, temperature stress, salt stress, heavy metal stress, water stress etc. Exposure of plants to theses stresses causes huge losses to crops. Under limited water resources of Saudi Arabia, these losses are more severe that not only affect crop production but also cause depletion of precious ground water resources.</p>	الهوية البحثية للمجموعة Group identity
<p>Developing plant tolerance to environmental stresses such as drought stress, temperature stress, salt stress, heavy metal stress, water stress etc. for sustainable agriculture research programmes. 2. To develop stress-tolerant crops for supporting National priority of Environmental Sustainability and Essential Needs. 3. Improving crop production, under environmental stresses through manipulating the inherent cellular mechanisms of the plants. 4. Improvng water-use efficiency of crop plants to reduce water loss that will help in saving precious water resources of the Kingdom. 5. The goals of the proposed plan are aligned with the goals of VISION 2030 and NEOM of building a sustainable agricultural sector that contributes to achieving food and water security.</p>	أهداف المجموعة Group goals
<p>To reduce the adverse effect of environmental stresses on economically important crop plants grown in Saudi Arabia. 2. Using Biotechnological approaches, development of crop plants with the capacity to survive and grow under water stress and drought stress conditions. 3. To find out key defence mechanisms in crop plants that are helpful in combating environmental stresses. 4. Using emerging phytohormones and signalling molecules, developing tolerance in crop plants against detrimental effects of environmental stresses such as drought, salinity, temperature, water etc. 5. Development of phytoremediation techniques for Decontamination of agricultural fields.</p>	نشاط المجموعة Group activity

المجموعة (٨٨)

Eco-Friendly Plant Diseases Control Group	اسم المجموعة Group Name
<ul style="list-style-type: none"> Khalaf M. Alhussaen 	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Mohammad Nasir Khan 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Manzer H. Siddiqui من جامعة سعودية Mohd. Sayeed Akhtar خبير 	المشاركين من خارج الجامعة Group members from outside the university
This research group is focusing on studying alternative and effective control methods other than chemical pesticides methods. An extensive survey of plant diseases spread in the Tabuk region will be conducted, and then possible and effective biological control methods will be employed and comprehended. This will reduce the use of chemical pesticides.	الهوية البحثية للمجموعة Group identity
Determination of successful biological control methods to eradicate plant pathogens in the Tabuk region. - Increasing farmers' awareness of the use of biological control - To find out advantages of using biological control methods and the disadvantages of using chemical pesticides. - Development of eco-friendly procedures of controlling plant pathogens	أهداف المجموعة Group goals
Conducting a survey of plant diseases spread in the Tabuk region and its farms. - Creating a database that includes plant diseases spread in the Tabuk region and their causes. - Conduct a survey on organisms that can eliminate plant pathogens. - Coming up with several organisms capable of eliminating plant pathogens in the Tabuk region.	نشاط المجموعة Group activity

المجموعة (٨٩)

Crop Quality Improvement in Tabuk Region	اسم المجموعة Group Name
Awatif Abdulmajeed	رئيس المجموعة Principle investigator
<ul style="list-style-type: none"> Siham AL Balawi Suhair Al Kabashi 	المشاركين من منسوبي الجامعة Group members from the university
<ul style="list-style-type: none"> Mona Hassan Soliman Haifa Abdulaziz ALHaithloul Amir Abdullah Khan 	المشاركين من خارج الجامعة Group members from outside the university
Biochar as a green strategy and nanotechnology as eco-friendly: A nexus to improve environmental safety and food security in cereal crops in Tabuk Region	الهوية البحثية للمجموعة Group identity
Find an integrated strategy for the exploitation of agricultural waste and exotic plants. -Using nanoparticles as upcoming future for improving the agricultural residues collected on a variety of food groups. -Assess the physical and chemical properties of biochar resulting from different types of waste and recommend the best type that gives the best output. -Training farmers in the production of compost and biochar to provide them with an organic product and another source of income for them. -Training students of the Faculty of Science from the primary and post-bachelor's degree suppositions on different techniques during the project activities	أهداف المجموعة Group goals
Plant Physiology- Plant Biology- Plant Biotechnology- Abiotic Stress Tolerance -Plant Environmental Stress - Physiology Crop Physiology- Plant Microbe interaction - Plant Pathology - Photosynthesis- Molecular Plant Physiology- Plant Biochemistry	نشاط المجموعة Group activity