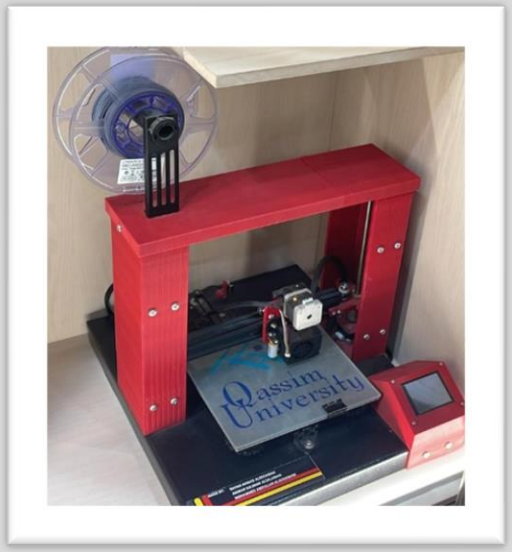
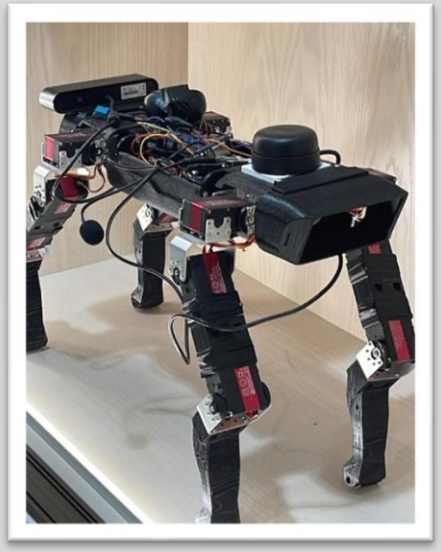
الرقم	الصورة	اسم المشروع	القسم العلمي	مشرف وطلاب المشروع	وصف مختصر
1		طائرة بدون طيار لحصاد التمور	قسم الهندسة الميكانيكية	مشروع بحثي د./ حنفى عمر ود سعد مكراس	النظام المُصمم يتكون من طائرة رباعية تحمل ذراعًا آليًا مزودًا بمنشار دوّار للإمساك بعرجون البلح وقطعه. الطائرة مزودة بطيار آلي وجهاز Raspberry PI مع كاميرا لقياس العمق، بينما الذراع يحتوي على كاميرا وبطارية لتشغيل محركاته. التحكم يتم عبر جهاز تحكم عن بعد وتطبيق أندرويد يعرض فيديو الكاميرات ويشغل الونش والذراع عبر WiFi.
٢		Design, Development, and Fabrication of a Fully Functional 3D FDM Printer with Custom Electronics and Printed Components تصميم وتطوير وتصنيع طابعة FDM ثلاثية الأبعاد كاملة الوظائف مع	Mechanical Engineering قسم الهندسة الميكانيكية		This project presents the design, development, and fabrication of a fully operational Fused Deposition Modeling (FDM) 3D printer, where the majority of structural components were manufactured using an existing FDM printer. The primary objective was to demonstrate the feasibility of creating a self-replicating 3D printing system, integrating custom-designed mechanical, electrical, and electronic control systems. Key components, including the printer frame, carriage assemblies, and extruder housing, were modeled using CAD software and fabricated using PLA filament for

		إلكترونيات مخصصة ومكونات مطبوعة			lightweight, durable, and cost-effective solutions. The electrical and electronic systems, comprising a custom-built control board, stepper motor drivers, heating system, and user interface, were designed and integrated to ensure precise movement control and thermal regulation. The printer was successfully calibrated and tested for its printing accuracy, layer resolution, and operational stability. This project highlights the potential of additive manufacturing in creating self-replicating systems, combining innovation in mechanical design, fabrication techniques, and custom electronics development for sustainable and cost-effective prototyping solutions. يقدم هذا المشروع تصميم وتطوير وتصنيع طابعة ثلاثية الأبعاد تعمل بكامل طاقتها باستخدام تقنية النمذجة بالترسيب المندمج (FDM)، حيث تم تصنيع غالبية المكونات الهيكلية باستخدام طابعة FDM موجودة. كان الهدف الأساسي هو إثبات جدوى إنشاء نظام طباعة ثلاثية الأبعاد قادر على التكرار الذاتي، ودمج أنظمة التحكم الميكانيكية والكهربائية والإلكترونية المصممة خصيصًا. تم تصميم المكونات الرئيسية، بما في ذلك إطار الطابعة وتجميعات العربة وغلاف الطارد، باستخدام برنامج CAD وتم تصنيعها باستخدام خيوط PLA للحصول على حلول خفيفة الوزن ومتينة وفعالة من حيث التكلفة. تم تصميم الأنظمة الكهربائية والإلكترونية، التي تتألف من لوحة تحكم مخصصة، ومحركات محرك

					متدرج، ونظام تسخين، وواجهة مستخدم، وتم دمجها لضمان التحكم الدقيق في الحركة والتنظيم الحراري. تم معايرة الطابعة واختبارها بنجاح من حيث دقة الطباعة ودقة الطبقة والاستقرار التشغيلي. يسلط هذا المشروع الضوء على إمكانات التصنيع الإضافي في إنشاء أنظمة قادرة على التكرار الذاتي، والجمع بين الابتكار في التصميم الميكانيكي وتقنيات التصنيع وتطوير الإلكترونيات المخصصة للحصول على حلول نماذج أولية مستدامة وفعالة من حيث التكلفة.
٣		تقنية حديثة لاستخلاص الماء من الهواء من أجل استدامة المدن والمجتمع	الهندسة الميكانيكية	أ.د. عبد الرحمن ابراهيم العطية د. وليد حسن الجرايحي النموذج الابتدائي الطالب/ فارس المسند الطالب / عمار القويع الطالب/ ابراهيم الحرابي النموذج المطور الطالبة/ لميس عبدالمحسن القاضي	في السعي وراء تطوير تكنولوجيا حصاد المياه، تم تصميم نظام مبتكر بدقة. تم تصميم هذا النظام المبتكر بهدف أساسي يتمثل في تقليل استهلاك الطاقة بشكل كبير، وبالتالي المساهمة في ممارسات حصاد المياه الأكثر استدامة والصديقة للبيئة. تم تصميم الجهاز للعمل بسلاسة، وقادر على حصاد المياه بكفاءة من البيئة المحيطة. علاوة على ذلك، فإن تعدد استخدامات نظام حصاد المياه هذا يسمح بنشره في المناطق النائية وخارج الشبكة، مما يوسع إمكانية الوصول إليه وقابليته للتطبيق في المناطق ذات البنية التحتية المحدودة. تم تصميمه خصيصا لتسخير مصادر الطاقة المتجددة، مما يضمن أنه يعمل بكفاءة دون الاعتماد على شبكات الطاقة التقليدية. يعمل نظام حصاد المياه المبتكر على سلسلة من العمليات المصممة بشكل معقد، والتي تتكرر عدة مرات على مدار اليوم لزيادة إنتاج المياه

٤	مركبة باراشوتية		قسم الهندسة الميكانيكية	مشروع بحثي د./ حنفى عمر ود سعد مكراس	مركبة طائرة باراشوتية يمكن التحكم فيها عن بعد
٥	Integrated Robotic and Sensing Systems for Smart Dog Robot أنظمة الروبوتات والاستشعار المدمجة للروبوت الذكي		Electrical Engineering Dept. قسم الهندسة الكهربائية	Supervisor: Dr. Fahad Alsunaydih Students: ١. سليمان القريشى ٢. سند عبدالله الحصيني ٣. عمر مطر الحربي	The Smart Dog Robot (SDR) project aims to develop an advanced robotic system capable of navigating diverse environments and performing tasks with high precision and reliability. The project's core focus is the integration of multiple subsystems, including environmental monitoring, camera-based object and person detection using Machine Learning (ML), LiDAR-based navigation, and voice interaction. In the second phase of the project, we concentrated on enhancing and integrating these subsystems to create a cohesive and efficient robotic solution. The environmental monitoring system, which utilizes an MQ135 gas sensor and a DHT11 temperature and humidity sensor, was integrated with a Blynk app to facilitate real-time data visualization and notifications when sensor readings surpass predefined thresholds. Additionally, the camera module was linked to the Blynk app,

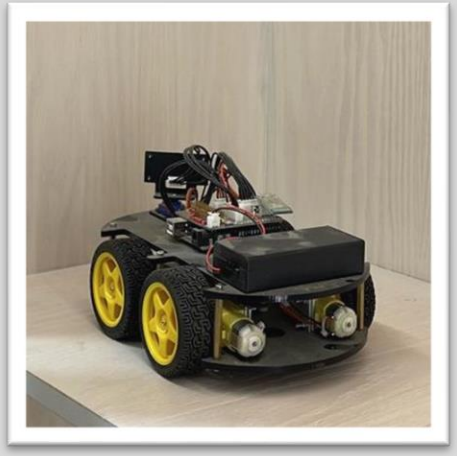
enabling instant alerts when a person or a targeted object is detected.To further enhance the robot's navigational capabilities, we integrated RPLiDAR system. This integration allows the robot to detect a person and autonomously navigate towards them using the angle and distance information provided by the LiDAR. Moreover, we developed a voice interactive system using a microphone for voice input, which is then converted to text and processed by the ChatGPT API. The robot's response is subsequently converted back to speech and outputted through a speaker, enabling seamless conversational interactions. Lastly, we propose three distinct application themes for the Smart Dog Robot: a rescue dog for emergency situations, a security dog to assist law enforcement, and a home companion to monitor and interact with family members, particularly children. The culmination of these enhancements and integrations results in a highly versatile and interactive robot capable of operating in various settings, providing valuable services that enhance safety, security, and companionship. The Smart Dog Robot has the potential to revolutionize the way we approach					

tasks in emergency response, law enforcement, and home care.					
This project presents the design, development, and successful implementation of a robotic arm driven by a four-bar linkage mechanism, aimed at achieving precise motion control for educational and industrial applications. The system integrates a set of gears and mechanical arms to convert rotational motion into controlled angular displacement, facilitating precise positioning and movement. The four-bar linkage provides a stable and efficient mechanism for transferring motion, offering a balance of simplicity, accuracy, and versatility. The project involves the use of lightweight materials, such as laser-cut MDF, and incorporates basic electronic components to control the arm's motion via a microcontroller. The effectiveness of the system was validated through practical testing, demonstrating its ability to perform complex tasks with high accuracy and reliability. This work serves as a foundation for further exploration in the fields of robotics, automation, and mechanical design, with potential applications in educational models, prototype development, and automation systems. Future		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Four-Bar Linkage-Based Robotic Arm for Precision Motion Control تصميم وتنفيذ ذراع آلية تعتمد على وصلات ذات أربعة قضبان للتحكم الدقيق في الحركة		٦

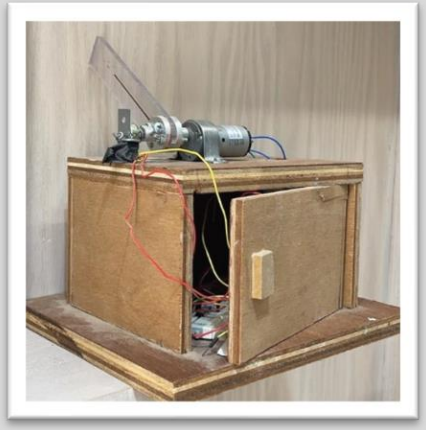
improvements could involve integrating advanced sensors, motor control systems, and higher-level algorithms for enhanced functionality and adaptability					
This project presents the design, development, and successful implementation of a 3D-printed robotic arm, developed for precision handling and automation tasks. The system utilizes open-source components and software, providing an affordable and versatile solution for educational and research applications. The robotic arm, based on a modular design, was constructed using lightweight materials and integrated with stepper motors to enable accurate and repeatable motion control across multiple degrees of freedom. The control system was implemented using a microcontroller and custom software, allowing for real-time interaction and task automation. The arm was tested for various tasks, including object manipulation, pick-and-place operations, and precision positioning, demonstrating high accuracy and robustness in execution. This project highlights the potential of 3D-printed robotic arms in education, prototyping, and small-scale automation, offering a hands-on approach to learning robotics and		**Mechanical Engineering**	**Design and Implementation of a 3D-Printed Robotic Arm for Precision Handling and Automation** **تصميم وتنفيذ ذراع روبوتية مطبوعة بتقنية الطباعة ثلاثية الأبعاد للتعامل الدقيق والأتمتة**		٧

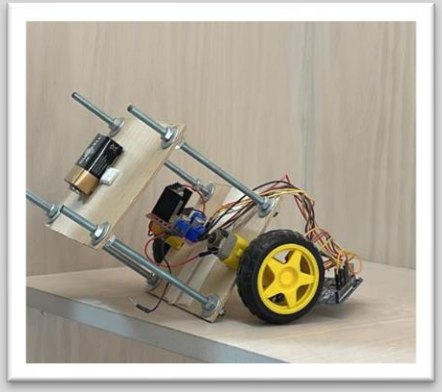
automation concepts. Future work could focus on enhancing the arm's capabilities by incorporating advanced sensors, vision systems, and machine learning algorithms for improved autonomy and adaptability يقدم هذا المشروع تصميم وتطوير وتنفيذ ناجح لذراع آلية مدفوعة بآلية ربط بأربعة قضبان لتحقيق التحكم الدقيق في الحركة للتطبيقات التعليمية والصناعية. يدمج النظام مجموعة من التروس والأذرع الميكانيكية لتحويل الحركة الدورانية إلى إزاحة زاوية محكومة، مما يسهل تحديد المواقع والحركة بدقة. يوفر الربط بأربعة قضبان آلية مستقرة وفعالة لنقل الحركة، مما يوفر توازنًا بين البساطة والدقة والتنوع. يتضمن المشروع استخدام مواد خفيفة الوزن، مثل MDF المقطوع بالليزر، ويتضمن مكونات إلكترونية أساسية للتحكم في حركة الذراع عبر متحكم دقيق. تم التحقق من فعالية النظام من خلال الاختبارات العملية، مما يدل على قدرته على أداء المهام المعقدة بدقة وموثوقية عالية. يعمل هذا العمل كأساس لمزيد من الاستكشاف في مجالات الروبوتات والأتمتة والتصميم الميكانيكي، مع تطبيقات محتملة في النماذج التعليمية وتطوير النماذج الأولية وأنظمة الأتمتة. قد تتضمن التحسينات المستقبلية دمج أجهزة استشعار متقدمة وأنظمة تحكم في المحركات وخوارزميات أعلى مستوى لتحسين الوظائف والقدرة على التكيف يقدم هذا المشروع تصميم وتطوير وتنفيذ ناجح لذراع روبوتية مطبوعة ثلاثية الأبعاد، تم تطويرها لمهام المناولة الدقيقة والأتمتة. يستخدم النظام مكونات وبرامج مفتوحة المصدر، مما يوفر حلاً ميسور التكلفة ومتعدد الاستخدامات للتطبيقات التعليمية والبحثية. تم بناء الذراع الروبوتية، استنادًا إلى تصميم معياري، باستخدام مواد خفيفة الوزن ومتكاملة مع محركات متدرجة لتمكين التحكم الدقيق والمتكرر في الحركة عبر درجات متعددة من الحرية. تم تنفيذ نظام التحكم				

					باستخدام متحكم دقيق وبرنامج مخصص، مما يسمح بالتفاعل في الوقت الفعلي وأتمتة المهام. تم اختبار الذراع لمهام مختلفة، بما في ذلك التلاعب بالأشياء وعمليات الالتقاط والوضع وتحديد المواقع بدقة، مما يدل على الدقة العالية والمتانة في التنفيذ. يسلط هذا المشروع الضوء على إمكانات الأذرع الروبوتية المطبوعة ثلاثية الأبعاد في التعليم والنماذج الأولية والأتمتة على نطاق صغير، مما يوفر نهجًا عمليًا لتعلم مفاهيم الروبوتات والأتمتة. يمكن أن يركز العمل المستقبلي على تعزيز قدرات الذراع من خلال دمج أجهزة استشعار متقدمة وأنظمة رؤية وخوارزميات التعلم الآلي لتحسين الاستقلالية والقدرة على التكيف
٨		نظام للتحكم في الزاوية باستخدام قوة المروحة	قسم الهندسة الميكانيكية		لتعلم مبادئ التحكم والتعامل مع الحساسات والمواتير والمتحكمات الدقيقة

An Arduino-controlled line follower car is a robotics project that involves building a small car capable of autonomously following a black line on a white surface. This project is a great introduction to robotics, electronics, and programming. **Core Components:** **Arduino Microcontroller: The brain of the car, responsible for processing sensor data and controlling the motors.** **DC Motors: Power the car's movement.** **Motor Driver: Amplifies the Arduino's signals to control the motors.** **Line Sensors: Detect the black line on the white surface.** **Chassis: The physical structure of the car.** **Battery: Provides power to the components.**	**Supervisor:** **Dr. Mohamed Nejlaoui** **Students:** **Abdulhamed Alhumood** **Abdullah Alsulaim**	**قسم الهندسة الميكانيكية**	**Designing an Arduino-Controlled Line Follower Car** **تصميم سيارة تتبع خط يتم التحكم بها بواسطة الأردوينو**		٩

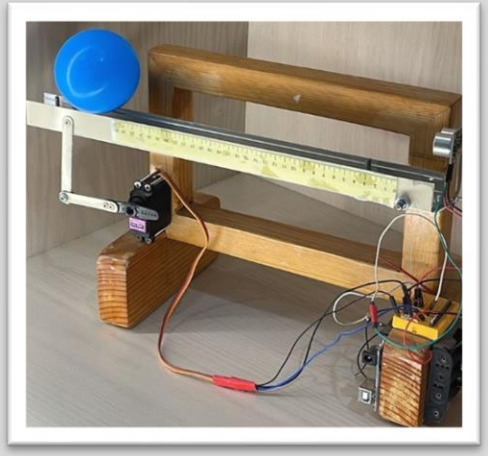
١١		Automated Syringe-Based Dispensing System for Controlled Fluid Delivery نظام توزيع آلي قائم على المحقنة لتوصيل السوائل بشكل متحكم	MechanicalEngineering قسم الهندسة الميكانيكية		This course project presents the design and implementation of an automated syringe-based dispensing system for controlled fluid delivery. The system incorporates a series of syringes, each connected to a network of tubes and valves, enabling precise dispensing of desired volumes of different fluids. By actuating the valves, the system can deliver fluids with high accuracy and repeatability. The system is mounted on a stable wooden base and includes a user interface for programming dispensing sequences and volumes, facilitating ease of use and customization. Successful testing has demonstrated the system's capabilities, making it a valuable tool for various applications including laboratory research, medical procedures, and industrial processes

This course project presents the design and implementation of a simple robotic arm with motorized actuation. The arm is constructed primarily of wood and incorporates a DC motor to drive its movement. A series of linkages and joints connect the motor to the arm, enabling it to perform basic pick-and-place operations. The arm is mounted on a stable wooden base for support. Successful testing has demonstrated the system's capabilities in controlled movement and object manipulation. This project provides a valuable educational platform for students to learn about fundamental robotics principles, including kinematics, motor control, and mechanical design.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Simple Robotic Arm with Motorized Actuation تصميم وتنفيذ ذراع روبوتية بسيطة تعمل بمحرك		١٢
ذراع روبوتية لتعليم التحكم في المواتير والطباعة الثلاثية		قسم الهندسة الميكانيكية	ذراع روبوتية		١٣

A two-wheeled self-balancing vehicle, often referred to as a balance bot, is a fascinating robotics project that involves building a robot capable of maintaining its balance on two wheels. This project demonstrates the principles of dynamic stability, sensor fusion, and motor control. **Core Components:** **Arduino Microcontroller: The brain of the robot, responsible for processing sensor data and controlling the motors.** **DC Motors: Power the robot's movement.** **Motor Driver: Amplifies the Arduino's signals to control the motors.** **IMU (Inertial Measurement Unit): Measures the robot's orientation and angular velocity.** **Battery: Provides power to the components.**	**Supervisor:** **Dr. Mohamed Nejlaoui** **Students:** **Ali Al Mansour** **Abdullah Al Omary**	**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Designing a Two-Wheeled Self-Balancing Vehicle** **تصميم مركبة ذاتية التوازن ذات عجلتين**		١٤

Color sorting is just sorting items based on color, as the name would imply. Although sorting things by sight is simple, automatic color sorting machines come in handy when there are a lot of items to sort, and the task is repetitive. These devices use a color sensor to identify the color of any object. A stepper motor then grabs the object and places it in the appropriate pot. They can be applied in a variety of contexts where color sorting, identification, and distinction are crucial. The agriculture industry (fruit sorting based on color), the food industry, the mining and diamond industries, recycling, and other sectors are some of the application areas. The uses are not restricted to this; They can also be extended to other sectors of the economy. Keywords: Color sorting; Industrial automation; Sorting technology	Prof. Ahmed Alaa ١. Yasier S. Al-Dubayyan ٢. Abdulrahman M. Al-Osaili	Electrical Engineering Dept. قسم الهندسة الكهربائية	Designing an automated system for sorting based on colors تصميم نظام آلي لفرز الأجسام بناءً على الألوان		١٥

This project presents the design and implementation of a simple robotic arm with a gripper mechanism. The arm is constructed using a combination of materials and incorporates a DC motor to drive its movement. A series of linkages and joints connect the motor to the arm, enabling it to perform basic pick-and-place operations. The arm is equipped with a gripper mechanism at the end-effector, allowing it to grasp and manipulate objects. The system is powered by batteries and includes electronic control components. Successful testing has demonstrated the system's capabilities in controlled movement, object grasping, and manipulation. This project provides a valuable educational platform for students to learn about fundamental robotics principles, including kinematics, motor control, gripper design, and basic electronics.		**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Design and Implementation of a Simple Robotic Arm with Gripper Mechanism** **تصميم وتنفيذ ذراع روبوتية بسيطة مع آلية الإمساك**		١٦

This project presents the design and implementation of a mini lathe machine for educational purposes. The machine incorporates a DC motor to drive the rotation of the workpiece and features a spindle to hold the workpiece securely. A stable base provides support for the machine. The system has been successfully tested and demonstrated to be capable of basic turning operations. This project provides a valuable educational platform for students to learn about fundamental machining principles, including workpiece rotation, tool positioning, and material removal.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Mini Lathe Machine for Educational Purposes تصميم وتنفيذ مخرطة صغيرة لأغراض تعليمية		١٧
نظام التحكم في الكرة والعارضة هو نظام يُستخدم لدراسة مفاهيم التحكم الآلي. يتكون من عارضة أفقية يمكن إمالتها لتوجيه كرة على سطحها، حيث يهدف التحكم إلى تحقيق التوازن والحفاظ على الكرة في موقع معين أو تحريكها بشكل مستقر عبر العارضة باستخدام الأردوينو وحساس مسافة		قسم الهندسة الميكانيكية	Ball and Beam Control System نظام للتحكم في مكان الكرة علي العارضة		١٨

Automation is being fueled by a multifaceted approach to technological advancements, which includes advances in artificial intelligence, robotics, sensors, and cloud computing. The use of automated, as opposed to conventional, systems, has become more popular in recent years. Project Purpose: Modern agricultural technology has played an important role in the development of Saudi Arabia in addition to upgrading infrastructure and plans. Agriculture in Saudi Arabia is dependent upon wells, which are insufficient in terms of water supplies. Hypothesis: Thus, irrigation is used for agricultural fields, depending on the soil type, and water is provided to the plants. Two essential elements are necessary for farming, the first is the ability to determine the soil's fertility, and the second is the use of different technologies to reduce the dependence of water on electrical power and on/off schedules. Research Procedure: The purpose of this study is to propose a system in which moisture sensors are placed under trees or plants. The gateway unit transmits sensor information to the controller, which then turns on the pump and recycles the water flow. Conclusion: A farmland's water	Supervisor: Dr. Mohammad Islam	Electrical Engineering Dept. قسم الهندسة الكهربائية	Real time IOT based irrigation system using solar energy نظام ري ذكي يعتمد على إنترنت الأشياء ويعمل بالطاقة الشمسية في الزمن الحقيقي		١٩

pump can be remotely controlled and parameters such as moisture and flow rate can be monitored using an HTTP dashboard. In order to evaluate the applicability of IOT-based automatic wastewater irrigation systems, a pilot test was conducted using the developed framework. Theoretically, such a system could be expanded by including any pre-defined selection parameters.					
This project encompasses the development and characterization of three distinct prototypes utilizing advanced manufacturing techniques. The first prototype involves the fabrication of fiber metallic laminate tensile specimens using hand-lay and vacuum bag molding techniques, followed by mechanical testing to evaluate their tensile properties. The second prototype is a hat manufactured from polycarbonate using an injection molding machine, showcasing the rapid prototyping capabilities of this technique. Finally, the third prototype demonstrates the potential of robotic wire arc additive manufacturing by creating a dissimilar aluminum system, highlighting the versatility and precision of this technology. These prototypes collectively showcase the advancements in materials science and manufacturing processes,	**Dr.S.Sivasankaran**	**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Development and Characterization of Advanced Manufacturing Prototypes** **تطوير وتوصيف نماذج التصنيع المتقدمة**		**٢٠**

paving the way for innovative solutions in various engineering applications.					
This project presents the design and implementation of a mobile robotic arm for object manipulation tasks. The system incorporates a multi-jointed robotic arm mounted on a mobile platform equipped with wheels. The arm is actuated by a motor and features a gripper mechanism at the end-effector for grasping and manipulating objects. The mobile platform allows the arm to navigate and reach objects in different locations. The system is powered by batteries and includes electronic control components for coordinated movement of the arm and base. Successful testing has demonstrated the system's capabilities in navigating, grasping, and manipulating objects within a defined workspace. This project provides a valuable educational platform for students to learn about mobile robotics, kinematics, motor control, gripper design, and basic electronics.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Mobile Robotic Arm for Object Manipulation تصميم وتنفيذ ذراع روبوتية متحركة للتلاعب بالأشياء		٢١

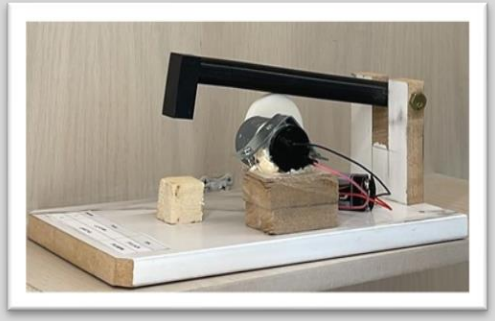
This project presents the design and implementation of a multi-fingered robotic arm with dexterous manipulation capabilities. The arm features multiple degrees of freedom, allowing for precise positioning and orientation of the end-effector. A multi-fingered gripper is integrated at the end-effector, enabling the arm to grasp and manipulate objects with varying shapes and sizes. The arm is mounted on a stable base and incorporates a control panel for manual operation. Successful testing has demonstrated the arm's ability to perform complex manipulation tasks, showcasing its potential for applications in research, education, and industrial automation. This project provides a valuable platform for students to learn about advanced robotics concepts, including kinematics, control algorithms, and gripper design.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Multi-Fingered Robotic Arm with Dexterous Manipulation Capabilities تصميم وتنفيذ ذراع روبوتية متعددة الأصابع ذات قدرات تحكم بارعة		٢٢

٢٣		تحليل وتصميم برج تبريد خرساني مسلح ذو مسودة طبيعية زائدية	قسم الهندسة المدنية	أ.د. محمد عارف عبدالرشيد	تسعى المملكة العربية السعودية التي يزيد عدد سكانها عن ٣٣ مليون نسمة إلى تنويع وزيادة قدرتها على إنتاج الطاقة من أجل استمرار النمو الاقتصادي. وتعتبر وثيقة "رؤية ٢٠٣٠" الطاقة النووية مصدرًا مهمًا لدعم الاستقرار والنمو المستدام. وقد بدأت الحكومة بخطط لبناء مفاعلات نووية بعد أن أعلنت أنها تريد إضافة الطاقة النووية إلى مزيج الطاقة في البلاد. تُستخدم أبراج التبريد على نطاق واسع من محطات الطاقة النووية والحرارية الكبيرة إلى الصناعات الصغيرة. أبراج التبريد هي أنظمة تبدد الحرارة في الغلاف الجوي من خلال عملية التبخر، وبالتالي توفر تبريد العمليات عبر مجموعة واسعة من التطبيقات بما في ذلك العديد من الصناعات مثل محطات الطاقة وتكرير النفط والمعالجة الكيميائية ومصانع الصلب وما إلى ذلك. برج التبريد هو في الأساس جهاز لرفض الحرارة، والذي يستخرج الحرارة المهدرة إلى الغلاف الجوي من خلال تبريد تيار من الماء إلى درجة حرارة أقل.
٢٤		Comparative Study of Element Migration from Aluminum and Stainless Steel Pressure Cookers During Meat Cooking دراسة مقارنة لهجرة العناصر من طناجر الضغط المصنوعة من الألومنيوم والفولاذ المقاوم للصدأ أثناء طهي اللحوم	Mechanical Engineering قسم الهندسة الميكانيكية	Dr.Hany Ammar, Dr.Fahad Al-Mufadi andDr.S.Sivasankaran	This study investigates the migration of elements from aluminum and stainless steel pressure cookers into meat during cooking. The study involves cooking meat in both types of pressure cookers under controlled conditions. Subsequent elemental analysis of the cooked meat samples was conducted to determine the levels of aluminum and other potentially relevant elements. The results were compared to evaluate the extent of element migration from each type of cooker. This study provides valuable insights into the potential health implications associated with using different types of pressure cookers and contributes

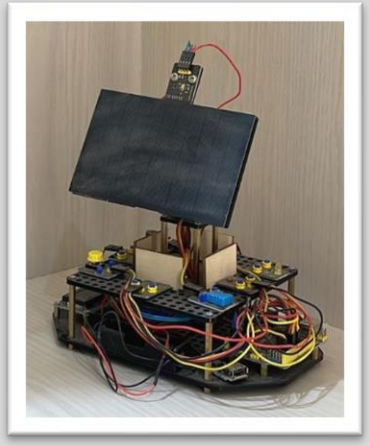
to a better understanding of food-metal interactions during cooking.					
This project presents the design and implementation of a parallel manipulator for precision positioning tasks. The manipulator utilizes a parallel kinematic structure with multiple links connecting the base to the end-effector, resulting in high stiffness and accuracy. The system incorporates multiple motors to actuate the joints and control the position and orientation of the end-effector. The manipulator is mounted on a stable base and incorporates a control system for precise positioning and motion control. Successful testing has demonstrated the manipulator's capability to achieve high positioning accuracy and repeatability, making it suitable for applications requiring precise motion control, such as assembly tasks, micro-manipulation, and machine tool applications. This project provides valuable hands-on experience for students in the areas of kinematics, dynamics, control systems, and precision engineering.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Parallel Manipulator for Precision Positioning تصميم وتنفيذ معالج متوازي لتحديد المواقع بدقة		٢٥

This project presents the design and fabrication of a miniaturized rolling mill for material processing applications. The mill incorporates two rotating cylinders driven by a gear mechanism and is enclosed within a robust frame. The design focuses on achieving precise control over the gap between the cylinders to enable controlled reduction of material thickness. The mill has been successfully fabricated using 3D printing techniques and tested with various materials, demonstrating its capability for material processing tasks such as sheet metal forming, wire drawing, and the creation of textured surfaces. This project provides valuable hands-on experience for students in mechanical design, manufacturing processes, and material science.	Dr.S.Sivasankaran	Mechanical Engineering قسم الهندسة الميكانيكية	Design and Fabrication of a Miniaturized Rolling Mill for Material Processing تصميم وتصنيع مطحنة درفلة مصغرة لمعالجة المواد		٢٦
This is a course project focuses on the design, development, and fabrication of a chess set, including chess pieces (coins) and a chessboard, using 3D printing technology. The primary objective was to develop a durable and aesthetically appealing chess set while integrating principles of design optimization, material selection, and precision manufacturing. The chess pieces were modeled using CAD software to ensure accurate		Mechanical Engineering قسم الهندسة الميكانيكية	Fabrication of Chess Coins and Boards using 3D printing تصنيع قطع وألواح الشطرنج باستخدام الطباعة ثلاثية الأبعاد		٢٧

geometry and proportions, adhering to standard chess dimensions. Various materials such as wood, polymers, or metals were considered, with emphasis on sustainability, cost-effectiveness, and durability. The chessboard was designed to complement the pieces and fabricated with precision to meet dimensional accuracy. Manufacturing methods, including 3D printing, CNC machining, and traditional handcrafting, were studied and compared to compare efficiency, surface finish, and feasibility for small-scale production. Finally, the students have fabricated the chess coins and boards using ABS materials of fusion deposition modelling method. This project provides a hands-on understanding of design principles, material science, and manufacturing processes, while promoting creativity and problem-solving in engineering applications.					

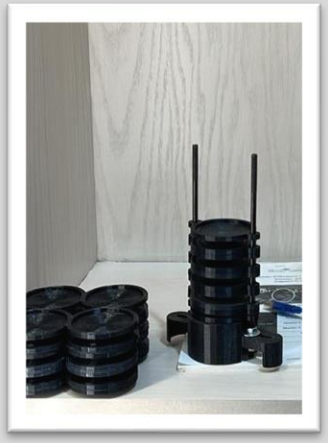
This project presents the design and implementation of a robotic cutting system for foam materials. The system incorporates a single-link robotic arm actuated by a DC motor to position a cutting tool. The arm is mounted on a stable base and controlled to move the cutting tool along a predefined path, enabling precise cutting of foam materials. The system has been successfully tested and demonstrated to be capable of accurately cutting foam shapes with varying levels of complexity. This project provides valuable hands-on experience for students in areas such as robotics, mechatronics, and control systems.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Robotic Cutting System for Foam Materials تصميم وتنفيذ نظام القطع الآلي للمواد الرغوية		٢٨
This project focuses on the design, development, and fabrication of a functional machine vice and a set of cylindrical weights of varying sizes using Fused Deposition Modeling (FDM) 3D printing technology. The primary objective was to demonstrate the applicability of additive manufacturing in producing lightweight, cost-effective, and customizable mechanical components for educational and practical purposes. The machine vice was designed to provide clamping		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Fabrication of a Machine Vice and Cylindrical Weights Using FDM 3D Printing Technology تصميم وتصنيع ملزمة وأوزان أسطوانية باستخدام تقنية الطباعة ثلاثية الأبعاد FDM		٢٩

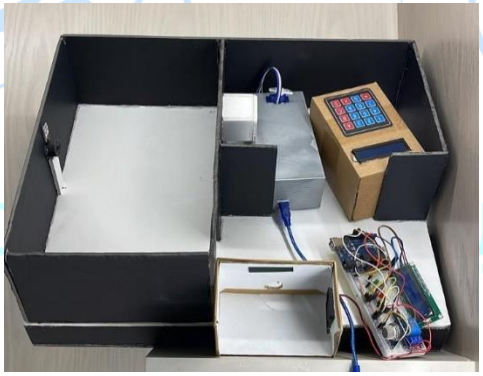
functionality for small-scale operations, with modular jaws and an optimized structure to balance strength and material efficiency. The cylindrical weights, featuring plug-type designs for ease of handling, were fabricated in different dimensions to achieve varied weight ranges. CAD software was used for modeling and optimizing the geometry of all components, ensuring accuracy and adherence to design specifications. PLA (Polylactic Acid) filament was selected as the printing material for its mechanical strength, affordability, and ease of use. This project highlights the advantages of FDM 3D printing technology in rapid prototyping and manufacturing of functional mechanical components with minimal material wastage					

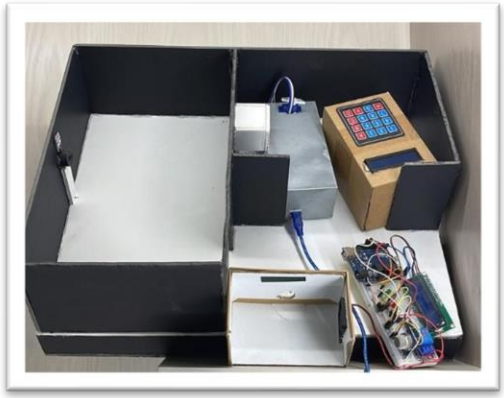
A solar tracker is a device that automatically adjusts the orientation of a solar panel to maximize solar energy absorption throughout the day. This project involves designing and building a solar tracker using an Arduino microcontroller. **Core Components:** **Arduino Microcontroller: The brain of the system, responsible for processing sensor data and controlling the motors.** **DC Motors: Power the solar panel's movement.** **Motor Driver: Amplifies the Arduino's signals to control the motors.** **Light Sensors: Detect the direction of the sun's light.** **Solar Panel: The device that converts solar energy into electrical energy.**	**Supervisor:** **Dr. Mohamed Nejlaoui** **Students:** **Faisal Alrshed** **Ibrahim Alharbi**	**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Designing an Arduino-Controlled Solar Tracker** **تصميم جهاز تعقب الطاقة الشمسية الذي يتم التحكم فيه بواسطة Arduino**		٣٠

٣٢		ذرارع روبوت	قسم الهندسة الميكانيكية		ذراع روبوت لتعليم التحكم في الروبوتات والتعرف علي الأشكال عن طريق الكاميرات
٣٣		Design and Implementation of a Quadcopter for Aerial Applications تصميم وتنفيذ طائرة رباعية المراوح للتطبيقات الجوية	Mechanical Engineering قسم الهندسة الميكانيكية		This project presents the design and implementation of a quadcopter for aerial applications. The quadcopter incorporates a robust frame, four brushless motors with electronic speed controllers (ESCs), and a flight control system. The flight control system utilizes inertial measurement units (IMUs) and GPS for navigation and stabilization. The quadcopter has been successfully assembled, calibrated, and tested in flight, demonstrating stable hovering, controlled flight maneuvers, and accurate waypoint navigation. This project provides valuable hands-on experience for students in areas such as aerodynamics, electronics, control systems, and flight control algorithms

٣٤		Design and Implementation of a Hexacopter for Aerial Applications تصميم وتنفيذ طائرة سداسية المراوح للتطبيقات الجوية	Mechanical Engineering قسم الهندسة الميكانيكية		This project presents the design and implementation of a hexacopter for aerial applications. The hexacopter incorporates a robust frame, six brushless motors with electronic speed controllers (ESCs), and a flight control system. The flight control system utilizes inertial measurement units (IMUs), GPS, and a barometer for navigation and stabilization. The hexacopter has been successfully assembled, calibrated, and tested in flight, demonstrating stable hovering, controlled flight maneuvers, and accurate waypoint navigation. The redundancy provided by the six motors enhances flight stability and fault tolerance. This project provides valuable hands-on experience for students in areas such as aerodynamics, electronics, control systems, and flight control algorithms, while exploring the advantages of a hexacopter configuration for aerial platforms.

٣٥		نظام القبة المنحنية جيب التمام متعدد الاستقرار لتبديد الطاقة المرنة	قسم الهندسة المدنية	د. منصور تركي التركي	يقترح هذا البحث تصميمًا مبتكرًا لتبديد الطاقة يعتمد على شبكة متسلسلة من قباب جيب التمام المنحنية. تتميز هذه القباب بسلوك مرن متعدد الاستجابات، مما يمكّنها من امتصاص الطاقة بشكل فعال وتبديدها عبر آلية هستيرية. أظهرت النتائج قدرة النظام على استعادة شكله الأصلي بعد تعرضه للإجهاد، مع تحقيق كفاءة تبديد عالية وصلت إلى عامل خسارة قصوى قدره ٠,١٤ في النموذج أحادي الاستقرار
٣٦		Design and Implementation of a Single-Screw Extruder for Material Processing تصميم وتنفيذ آلة بثق ذات لولب واحد لمعالجة المواد	Mechanical Engineering قسم الهندسة الميكانيكية		This project presents the design and implementation of a single-screw extruder for material processing applications. The extruder incorporates a helical screw rotating within a heated barrel, enabling the melting and conveying of various materials. The system includes a hopper for material feeding, a motor to drive the screw, and heating elements to maintain the desired processing temperature. The extruder has been successfully fabricated and tested with different materials, demonstrating its capability to process and extrude materials with varying properties. This project provides valuable hands-on experience for students in areas such as mechanical design, thermal engineering, and materials processing

This project presents the design and implementation of a model solar panel testing setup for educational purposes. The setup includes a scaled-down platform to mount the solar panels, a controlled light source to simulate solar irradiation, and a simplified data acquisition system to measure the output current and voltage. The system incorporates a variable load to simulate different operating conditions. The model was used to demonstrate the principles of solar panel operation, including the effect of light intensity and load resistance on power output. The project provides a valuable hands-on learning experience for students in areas such as renewable energy, electronics, and data acquisition.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Solar Panel Testing Setup تصميم وتنفيذ نظام اختبار الألواح الشمسية		٣٧
This project involves designing and building a gas detection system using an Arduino microcontroller. The system is designed to detect the presence of harmful gases, such as natural gas or carbon monoxide, in a home or other enclosed space. Upon detecting a gas leak, the system triggers an alarm to alert the occupants.	Supervisor: Dr. Mohamed Nejlaoui Student: BASEM ALRSHIDI	Mechanical Engineering قسم الهندسة الميكانيكية	Designing Arduino-Based Gas Leakage Detection Systems تصميم أنظمة الكشف عن تسرب الغاز المعتمدة على Arduino		38-1

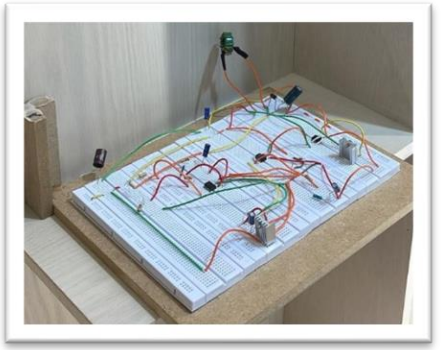
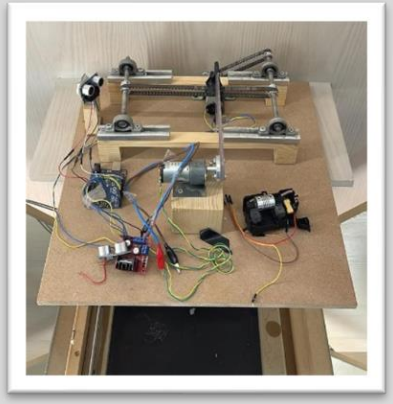
Core Components: **Arduino Microcontroller: The brain of the system, responsible for processing sensor data and triggering alarms.** **Gas Sensor: Detects the presence of specific gases.** **Buzzer: Emits an audible alarm.** **LED: Visual indicator of gas detection.** **Power Supply: Provides power to the components.**					
					**38-2**
This project presents the design and implementation of a model robotic lawn mower. The model incorporates a simplified navigation system utilizing ultrasonic sensors and a basic cutting mechanism. The robot is driven by small electric motors and operates within a confined area. The model demonstrates fundamental principles of autonomous navigation and robotic lawn mowing, including obstacle avoidance and basic path		**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Design and Implementation of a Model Robotic Lawn Mower** **تصميم وتنفيذ نموذج جزازة العشب الآلية**		**٤٠**

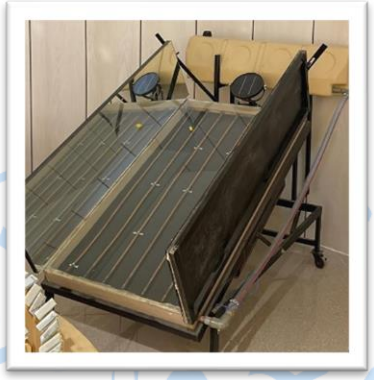
planning. This project provides a valuable hands-on learning experience for students in areas such as robotics, control systems, and mechatronics					
This project involves designing and building a smart cane, an assistive device equipped with sensors and an Arduino microcontroller to aid visually impaired individuals in navigating their surroundings. The cane can detect obstacles, alert the user to potential hazards, and provide directional guidance. Core Components: Arduino Microcontroller: The brain of the cane, responsible for processing sensor data and controlling the output devices. Ultrasonic Sensor: Detects obstacles in front of the user. Vibration Motor: Provides tactile feedback to alert the user. Buzzer: Emits audible alerts. Power Supply: Provides power to the components	Supervisor: Dr. Mohamed Nejlaoui Students: Ammar Alqawba Ahmed Almasoud	Mechanical engineering قسم الهندسة الميكانيكية	Designing a Smart Cane for the Blind تصميم عصا ذكية للمكفوفين		٤١

This project presents the design and implementation of a model motorized hammer mechanism. The system incorporates a small electric motor to actuate a wooden stick fitted with a model hammer head. A simplified linkage mechanism transfers the rotary motion of the motor to the linear motion of the hammer, demonstrating the principles of mechanical power transmission. The model has been successfully assembled and tested, showcasing the basic operation of a motorized hammering system. This project provides valuable hands-on experience for students in areas such as mechanical design, kinematics, and the application of simple machines.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Model Motorized Hammer Mechanism تصميم وتنفيذ نموذج آلي المطرقة الآلية		٤٢
This project involves creating a classic 3-in-a-row game, often known as Tic-Tac-Toe, using an Arduino microcontroller. Players will interact with the game through a simple interface, such as buttons or a keypad, and the game's state will be displayed on an LCD screen or LEDs. Core Components: Arduino Microcontroller: The brain of the game, controlling the game logic and user interface.	Supervisor: Dr. Mohamed Nejlaoui Students Mansour Al-Subaihi Abdul-Rahman Alsubaiee Abdul- Aziz Alrobiee	Mechanical engineering قسم الهندسة الميكانيكية	Designing a 3-in-a-Row Game with Arduino تصميم لعبة مكونة من ٣ عناصر في صف واحد باستخدام Arduino		٤٣

Input Devices: Buttons or a keypad for player input. **Output Devices: An LCD screen or LEDs to display the game board and results.**					
This project presents the design and implementation of a model vibration platform for educational purposes. The platform incorporates a vibrating mechanism, such as an eccentric motor or a rotating unbalanced mass, mounted on a stable base. The platform is designed to induce controlled vibrations in objects placed on its surface. The model was used to demonstrate the principles of vibration, including resonance and the effects of frequency and amplitude on object motion. This project provides valuable hands-on experience for students in areas such as mechanics, vibrations, and experimental investigation.		**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Design and Implementation of a Model Vibration Platform** **تصميم وتنفيذ منصة اهتزاز نموذجية**		**٤٤**
This project aims to design and fabricate a solar cooker optimized for the specific climatic conditions of Qassim, a region characterized by intense sunlight, high temperatures, and arid conditions. The solar cooker will harness solar energy to cook food efficiently, reducing reliance on traditional fuel sources and promoting sustainable living.	**Supervisor:** **Dr. Mohamed Nejlaoui** **Students** **Ali Al Mansour** **Azzam Al Muqbil** **Abdulaziz Al shihabi**	**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Experimental Analysis and Performance Optimization of a Solar Oven with Multi Reflector Arrangement**		**٤٥**

Key Design Considerations: **Solar Collector:** **Type: A box-type solar cooker is suitable for Qassim's climate, as it efficiently traps solar radiation.** **Material: Highly reflective materials (glass) has been used to maximize solar energy absorption.** **Insulation: Effective insulation material (Styrofoam) has been employed to minimize heat loss.** **Black Absorber Plate: A black-painted metal plate will absorb solar radiation and transfer it to the cooking pot.**			**التحليل التجريبي وتحسين أداء الفرن الشمسي مع ترتيب العاكسات المتعددة**		
This project presents the design and implementation of a model balance scale for educational purposes. The scale utilizes a rigid beam with two pans suspended from each end, supported by a central pivot point. The students designed and fabricated the scale using readily available materials, focusing on achieving precise balance and sensitivity. The model was used to demonstrate the principle of equilibrium and explore the concept of mass measurement. The project provides valuable hands-on experience for students in areas such as mechanics, materials science, and experimental design		**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Design and Implementation of a Model Balance Scale** **تصميم وتنفيذ نموذج ميزان التوازن**		٤٦

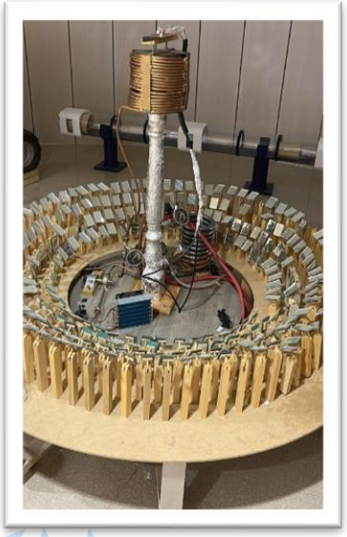
Designing a power converter for such applications presents a multifaceted challenge that demands a nuanced understanding of electrical engineering principles, renewable energy sources, and wireless communication protocols. Factors such as conversion efficiency, power density, size, and cost-effectiveness loom large in the design process, underscoring the need for innovative solutions that strike a delicate balance between performance and practicality.	Supervisor: Dr. Hammad Iqbal Sherazi Students: ١. Mamdouh Al Mutairi, ٢. Abdullah Al Rasheed,	Electrical Engineering Dept. قسم الهندسة الكهربائية	Design a power converter for applications of wireless power transfer (WPT) and renewable energy systems. تصميم محول طاقة لتطبيقات نقل الطاقة اللاسلكي (WPT) وأنظمة الطاقة المتجددة.		٤٧
This project presents the design and implementation of a model CNC machine for educational purposes. The machine utilizes a stepper motor to drive a carriage along linear rails, enabling precise positioning and movement in two dimensions. The system incorporates a simple control system to generate the desired motion paths. The model was used to demonstrate the principles of CNC motion control, including linear interpolation and point-to-point positioning. This project provides valuable hands-on experience for students in areas such as mechatronics, control systems, and computer-aided manufacturing.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Model CNC Machine تصميم وتنفيذ نموذج ماكينة CNC		٤٨

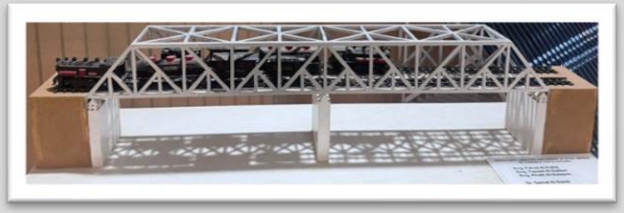
This senior design project investigated the effect of using concentrating techniques on the performance of FPC. The investigation was conducted experimentally on a modified locally fabricated FPC at College of Engineering of Qassim University. The collected results showed that the FPC system can achieve higher water temperatures by using of concentrators. The highest improvement for water temperature was found to be 65%. The improvement of the performance of solar collectors implemented in this work will increase the general knowledge of the use of solar energy in solar collectors. In addition, the study will also give a comprehensive picture of the capability of using of	Supervisor: Dr. Hussain Sadig Students: ١. Abdulhamid Alhmoud ٢. Abdullah Alsulaim Faisal Alrshed	Mechanical Engineering قسم الهندسة الميكانيكية	Improvement of Flat Plate Collector Performance (FPC) by implementation of Concentrating Techniques تحسين أداء المجمع ذي اللوح المسطح (FPC) من خلال تنفيذ تقنيات التركيز		٤٩

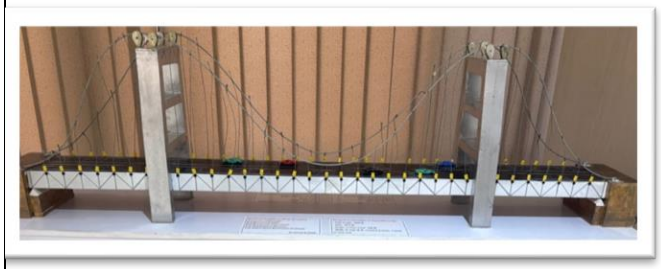
FPCs for water heating purposes in Qassim, KSA.					
This project aims to design and optimize a 4-bar exoskeleton that can assist human movement in a natural and intuitive manner. The focus is on achieving smooth and natural trajectories for the exoskeleton's linkages, mimicking human gait patterns. **Key Objectives:** **Gait Analysis:** **A detailed analysis of human gait patterns to identify key kinematic and kinetic parameters has been conducted** **Mechanism Synthesis:** **a 4-bar linkage mechanism has been analyzed has been analyzed has been analyzed that can replicate the desired human gait motions.** **Kinematic and Dynamic Analysis:** **kinematic and dynamic analysis to determine the joint angles, velocities, and accelerations required for natural motion, have been performed, have been performed**		**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Design optimization and fabrication of a 4-bar exoskeleton with natural trajectories** **تحسين تصميم وتصنيع هيكل خارجي مكون من ٤ قضبان بمسارات طبيعية**		**٥٠**

Optimization: **the exoskeleton's design parameters (link lengths, joint angles) have been optimized has been optimized to minimize joint torques and power consumption.**					
This project presents the design and implementation of a model robotic wire arc welding system. The system utilizes a robotic arm with multiple degrees of freedom to precisely position a welding torch. A wire feeder mechanism supplies continuous welding wire to the torch. [1] **The system incorporates basic motion control algorithms to guide the robot arm along predefined welding paths. The model demonstrates fundamental principles of robotic welding, including path planning, motion control, and wire feed coordination. This project provides valuable hands-on experience for students in areas such as robotics, mechatronics, and welding technology**		**Mechanical Engineering** **قسم الهندسة الميكانيكية**	**Design and Implementation of a Model Robotic Wire Arc Welding System** **تصميم وتنفيذ نظام لحام القوس الكهربي سلكي آلي نموذجي**		٥١

This project presents the design and implementation of a model flat-plate solar collector for educational purposes. The collector incorporates a flat, black-painted absorber plate covered with a transparent glazing material. A fluid channel is integrated within the absorber plate to circulate a heat transfer fluid. The system is designed to capture solar energy and transfer it to the fluid. The model was used to demonstrate the principles of solar energy collection, including heat transfer mechanisms and the impact of design parameters on collector efficiency. This project provides valuable hands-on experience for students in areas such as thermal engineering, renewable energy, and experimental investigation.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Model Flat-Plate Solar Collector تصميم وتنفيذ نموذج مجمع شمسي مسطح		٥٢

This project presents the design and implementation of a model concentrated solar power (CSP) system. The system utilizes an array of small mirrors to focus sunlight onto a central receiver. The concentrated solar energy heats a working fluid, which can then be used to generate electricity or for other thermal applications. The model demonstrates fundamental principles of solar energy collection and thermal energy conversion. This project provides valuable hands-on experience for students in areas such as solar energy, thermodynamics, and renewable energy systems.		Mechanical Engineering قسم الهندسة الميكانيكية	Design and Implementation of a Model Concentrated Solar Power (CSP) System تصميم وتنفيذ نظام نموذجي للطاقة الشمسية المركزة (CSP)		٥٣
This project presents the design and implementation of a model solar-powered go-kart. The model integrates a solar panel array to harvest solar energy, which is then stored in a battery bank. The stored energy powers an electric motor that drives the go-kart. The vehicle also incorporates basic electronic components for controlling the motor speed and monitoring the battery charge level. The model demonstrates the feasibility of utilizing solar energy to power a small-scale vehicle and provides valuable hands-on experience for students in areas such as renewable		Mechanical Engineering	Design and Implementation of a Model Solar-Powered Go-Kart تصميم وتنفيذ نموذج لسيارة الكارت تعمل بالطاقة الشمسية		٥٤

energy systems, electrical engineering, and vehicle design.					
This project presents the design and implementation of a model Hyperloop system. The model includes a scaled-down hyperloop tube and a model pod. The system demonstrates the principles of low-pressure environments and magnetic levitation, key technologies enabling high-speed transportation within the tube. The model provides valuable hands-on experience for students in areas such as fluid dynamics, electromagnetism, and high-speed transportation systems.	Dr.S.Sivasankaran	Mechanical Engineering	Design and Implementation of a Model Hyperloop System تصميم وتنفيذ نموذج لنظام هايبرلوب		٥٥
This project presents the design and construction of a model truss bridge using lightweight materials. The bridge incorporates a triangular lattice structure, utilizing the principles of structural mechanics to efficiently distribute loads and maximize strength. The students designed and fabricated the bridge, considering factors such as material selection, joint design, and load-bearing capacity. The model was tested under simulated loading conditions to evaluate its structural integrity and performance. This project provides valuable hands-on experience for students in areas such as structural engineering, materials science, and model building.	د. جمال السعدي	هندسة مدنية	Design and Construction of a Model Truss Bridge تصميم وبناء نموذج جسر الجمالون		٥٦

This project presents the design and construction of a model suspension bridge. The model incorporates key structural elements of a suspension bridge, including towers, cables, and a suspended deck. Students explored the principles of structural mechanics and load distribution in designing the bridge. The model was constructed using lightweight materials and tested for its load-bearing capacity. This project provides valuable hands-on experience for students in areas such as civil engineering, structural design, and model building, while fostering an understanding of the principles of suspension bridge construction.	د. جمال السعدي	هندسة مدنية	تصميم وبناء نموذج جسر معلق		٥٧
This project presents the design and construction of a model arch bridge using lightweight materials. The bridge incorporates a curved arch structure to support the load, demonstrating the principles of structural mechanics and load distribution. Students explored different arch geometries and analyzed their load-bearing capacities. The model was constructed with attention to detail, including accurate representation of the arch shape, supports, and deck. This project provides valuable hands-on experience for students in areas	د. جمال السعدي	هندسة مدنية	تصميم وبناء جسر قوسي		٥٨

such as civil engineering, structural design, and model building.					
This project presents the design and construction of a model truss structure utilizing gusset plates for joint connections. The model incorporates a radial arrangement of members connected at a central hub using gusset plates, demonstrating the principles of load transfer and structural stability. Students explored different gusset plate configurations and analyzed their impact on the overall strength and stiffness of the truss. The model was tested under simulated loading conditions to evaluate its performance and validate the design. This project provides valuable hands-on experience for students in areas such as structural engineering, materials science, and model building.	د. جمال السعدي	هندسة مدنية	تصميم وبناء نموذج لوح تقوية لجمالون		٥٩