



# SUSTAINABILITY REPORT 2021

## MUTAH UNIVERSITY

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# INTRODUCTION

## Message from the President

As the global pandemic continues to dominate headlines well into 2021, the growing risks of a climate crisis have also heightened public awareness that the effects of extreme weather, droughts, and wildfires cannot be ignored. The pandemic has revealed and exacerbated many pre-existing social problems, such as social and economic inequalities. Likewise, the climate crisis exacerbates existing inequalities, creating new challenges for already marginalized groups. Our response to the pandemic has shown that, as a society, we can collaborate to confront an existential threat, a lesson we must apply to the challenges of the climate crisis.

As societies strive to rebuild the world in the wake of the pandemic, we have a real opportunity to address global challenges in ways we have not seen before.

In this global context, more than ever, environmental sustainability and combating the climate crisis remain Mutah University's main priorities. This year, we continued to reinforce our commitment to tackling climate change, including advancing the university's Plan to achieve carbon neutrality; qualitative preparedness to confront climate change; Consulting with the University's Board of Trustees to expand and develop the health system in the areas of research, teaching, and accreditation.

I encourage all members of the Mutah University community to incorporate the goals and objectives outlined in this report into their work, both as a department and as an individual. Thank you for your continued commitment to building a more sustainable future for the University and our global community.

**Prof. Arafat A. Awajan**

**President**

**October 23, 2022**



# ABOUT THIS REPORT

This report outlines the progress of Mutah University in 2021 against the targets set in the Sustainability Plan 2017–2020. The reporting period covered in the Plan was completed in 2020. However, due to the operational challenges arising from the COVID-19 pandemic, it was extended to include 2021 to enable sufficient time and resources to develop the next Sustainability Plan. As many of the specifications were completed or superseded, this Report focuses on the University's progress explicitly related to the targets. The University's new Sustainability Plan 2030 will be released in December 2022.



The Global Reporting Initiative Standard (GRI Standards) and the United Nations Sustainable Development Goals (SDGs) implementation and progress at Mutah University are included in this Report. The Plan – and, therefore, this Report – focused on the environmental aspects of sustainability, including the social impacts inherent in the environment. It does not emphasize aspects or issues of social sustainability. These are covered in other University strategies and policies, including the Reconciliation Action Plan, the Diversity and Inclusion Strategy, and Health and Safety policies. The Report references other University publications and information to provide a holistic picture of the University's sustainability endeavors.

# OBJECTIVES

Campus sustainability can only be enhanced when our entire community is involved and empowered. From model school students to graduate students to off-campus, our entire community has played an essential role in helping MU become a leader in sustainability. We strive to make human health, wellness, inclusion, and accessibility a part of our work. We will continue to support students, organizations, faculty, staff, and offices that wish to participate and promote sustainability on campus.

The university is committed to creating and operating spaces conducive to living, working, and learning, environmentally friendly and healthy. Green buildings reduce a negative impact on the environment through energy and water efficiency, low-impact green building materials, and sustainable operating and maintenance procedures.

Maintaining sustainability progress as we continue to achieve our new goals requires broad campus support and integration with other campus initiatives. Acquiring all the plans and actions, we set for ourselves will require follow-up and supervision.





# THE CENTRAL ROLE OF EDUCATION IN CREATING THE SDGS CONTINUUM

The Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals designed to be a "blueprint for achieving a better and more sustainable future for all" see Figure 1. The SDGs were set to be achieved by the year 2030. Education for Sustainable Development (ESD) is directed towards achieving the SDGs. ESD for 2030 is the global framework for implementing SDGs from 2020-2030. ESD places emphasis on education's contribution to the achievement of the SDGs. Given the fact there is very little time left to achieve the SDGs, it is crucial to accelerate ESD in the decade of action to deliver the Goals, see Figure 1.

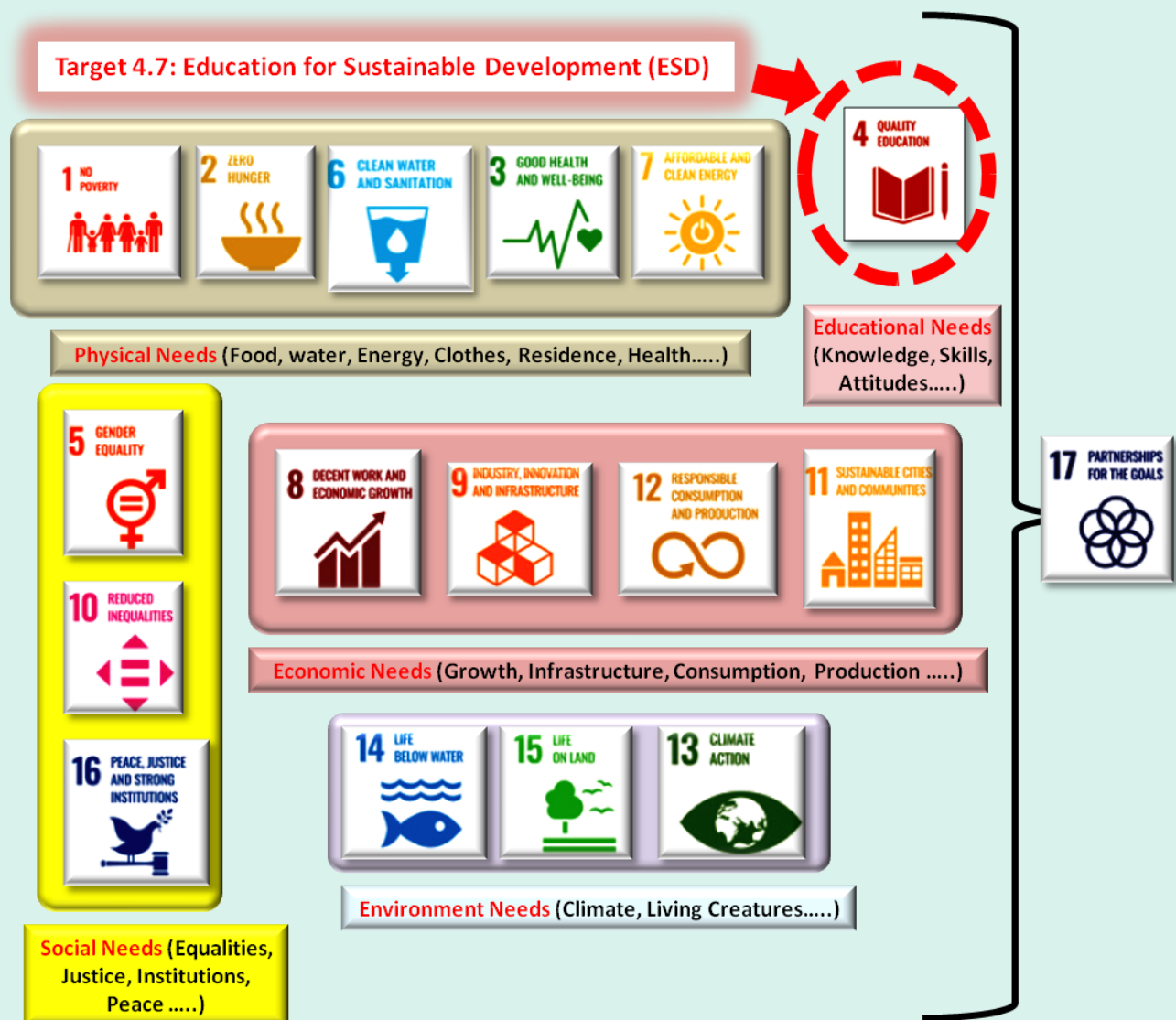


Figure 1: Sustainable Development Goals (SDGs) Structure and the core position of Education for sustainable development (ESD) in achieving these huge goals (Adapted from UNESCO 2020)

As shown in Figure 1, Education is at the heart of the SDGs. Education is key for progress toward achieving all SDGs and should therefore be part of the strategies to accomplish each. As All

SDGs are interdependent, the silo approach to education should be totally avoided. SDGs can only be achieved if implemented together. It is, therefore, necessary to go beyond a silo approach and ensure that the education sector is better articulated with other development sectors. To effectively convey the role of the collaborative work of all the SDGs and the crucial importance of making them work as a continuum, Jig Saw Analogy is visually created in Figure 2. The single piece of this puzzle is meaningless until all the pieces are arranged in a meaningful and corrent arrangement.

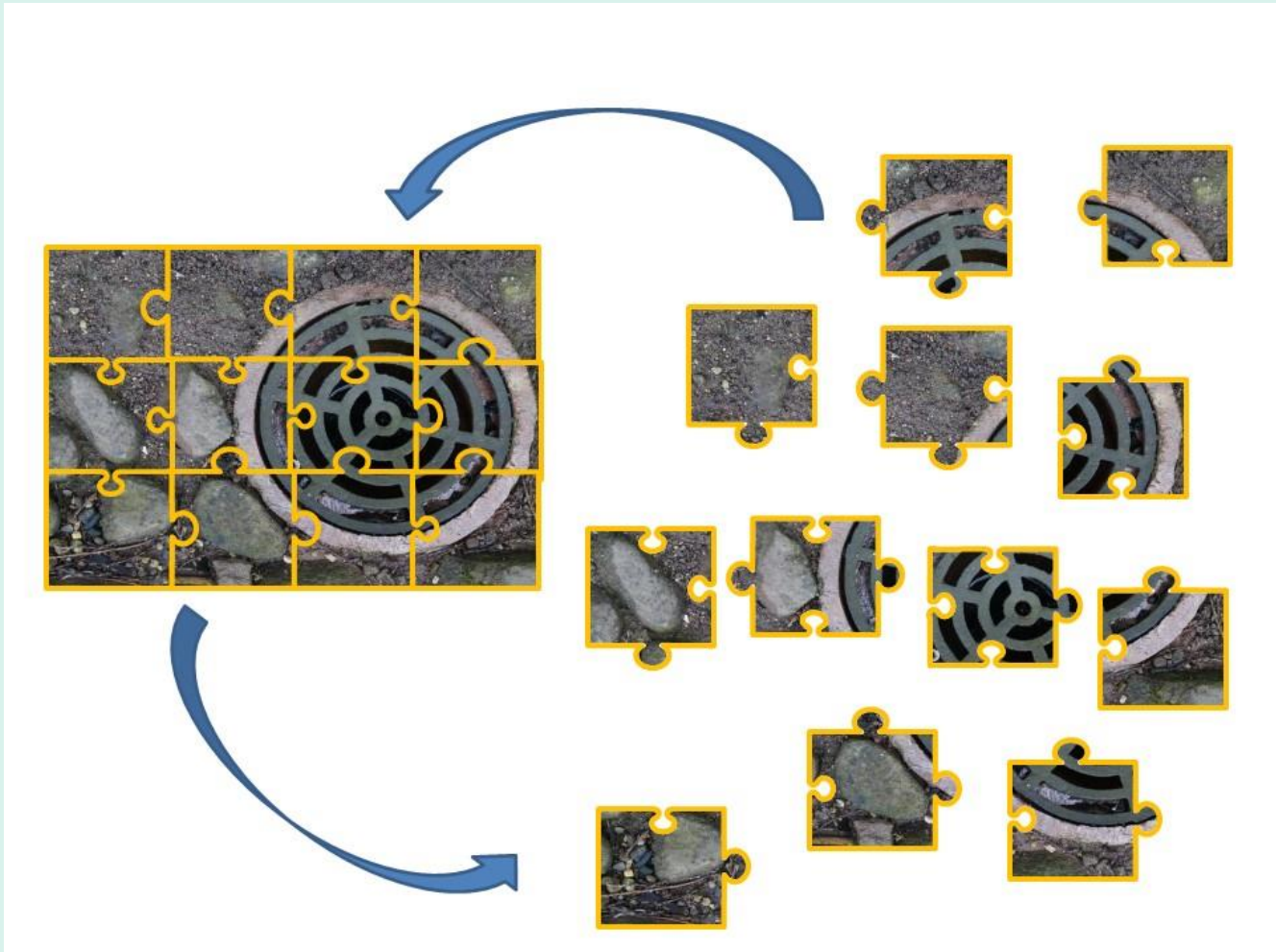


Figure 2: Jig Saw puzzle Analogy showing that Sustainable Development Goals (SDGs) are not fragmented pieces but forming a continuum that carries a meaning

Transforming our thinking from Silo, Fragmented, and Carousel Effect Thinking to Holistic and Meaningful Thinking is of paramount importance when dealing with SDGs. This new way of thinking is needed to enhance the ESD to equip individuals to take action against climate change, change consumption patterns, develop entrepreneurial and sustainable capabilities, and combat poverty by being productive. Integration is the most prominent characteristic of this new way of thinking to create a meaningful continuum.

# SUMMARY OF PROGRESS

## Objectives from Mutah's Environmental Sustainability

### Embodying Sustainability in Education & R&D

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- Enhancing research opportunities, grants and solutions for sustainable development
- Ensuring sustainability in daily research practice
- Boosting the curricula with sustainability related courses
- Ensuring undergraduate students from any program of study will have the opportunity to learn about sustainability in their courses.

### Practicing sustainably in the Campus

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- Monitoring the implementation of SDGs practices in the campus
- Promoting Practices that support sustainability among Mutah's stakeholders
- Boosting Go-Green Practices inside the Campus

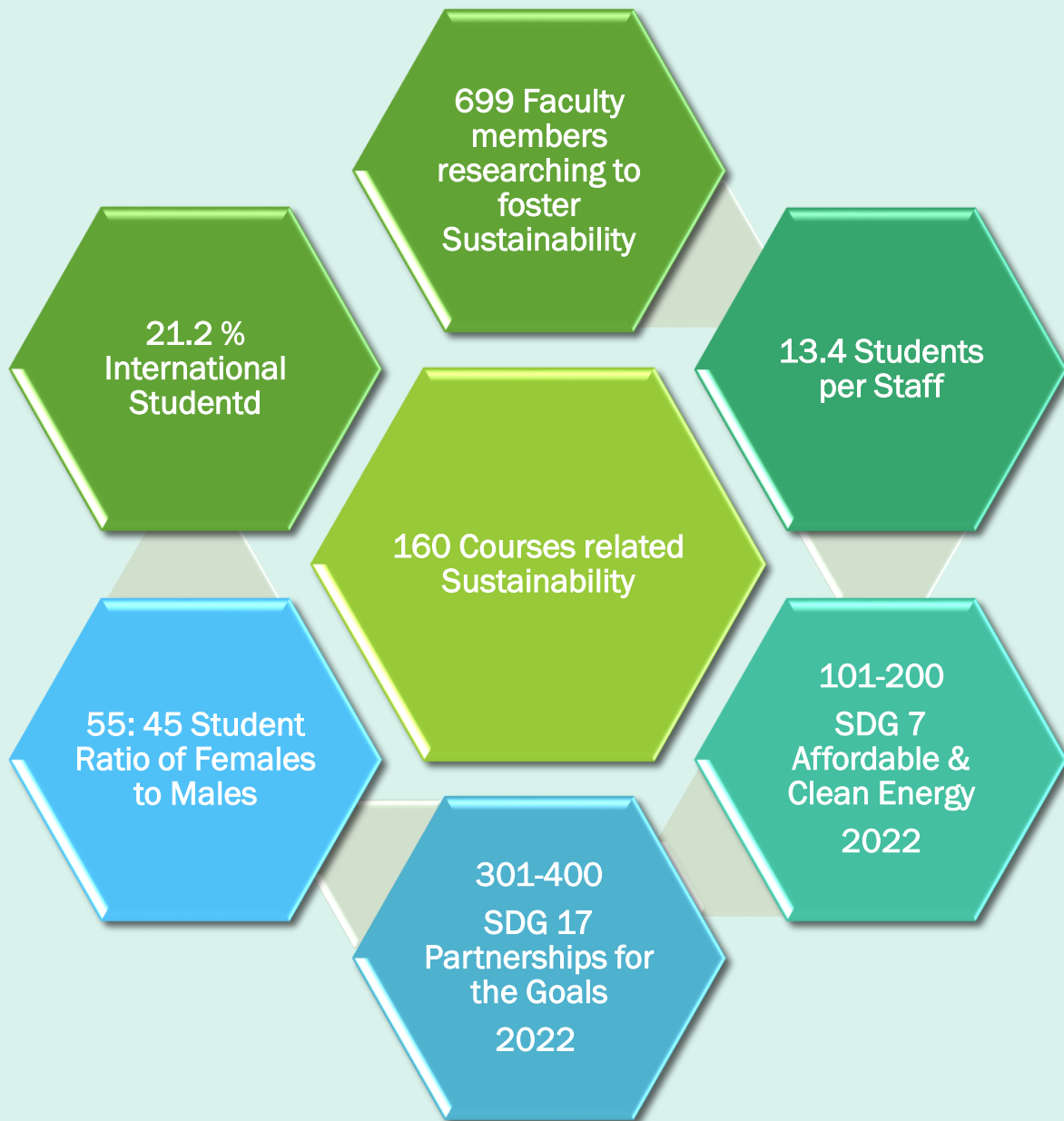
### Enforcing Sustainability Initiatives

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- Fostering the Principles of SDGs by organizational governance, operations and culture
- Developing Leaders of Sustainability



## Strategy Key Stats



## SDG1 NO POVERTY



During the academic year 2020/2021, the researchers in Mutah investigated many issues related to poverty, such as financial inclusion, quality of life, and child labor.

As the Deanship of Students Affairs documents, the proportion of students who receive financial aid to attend university because of poverty has increased this year by 5% above the last years.

Mutah University has made every effort to develop the capabilities of its stakeholders by making agreements to train them and develop their working skills. Examples of such an agreement were made with the Professional and Technical Skills Development Authority on 7<sup>th</sup> Jan. 2021 ([https://www.mutah.edu.jo/Lists/News/Disp\\_Form.aspx?ID=165](https://www.mutah.edu.jo/Lists/News/Disp_Form.aspx?ID=165)). Also, Mutah University signed a deal with Jordan Corporation for the Development of Economic Projects to enhance the entrepreneurial efforts of the stakeholders of the University in alignment with its strategic goal of creating and fostering the entrepreneurial culture in the region ([https://www.mutah.edu.jo/Lists/News/Disp\\_Form.aspx?ID=170](https://www.mutah.edu.jo/Lists/News/Disp_Form.aspx?ID=170)).



Many activities were directed towards conquering unemployment during the COVID -19 pandemic, such as "Youth and Unemployment Symposium: Challenges and Solutions," which

aimed to Enhance the capabilities of young people to find job opportunities that suit their abilities and scientific and practical capabilities and qualify them to obtain job opportunities in various fields ([https://www.mutah.edu.jo/Lists/News/Disp\\_Form.aspx?ID=191](https://www.mutah.edu.jo/Lists/News/Disp_Form.aspx?ID=191)). Mutah University held a panel discussion entitled Employment in the Light of the Corona Pandemic: Opportunities and Challenges on 7<sup>th</sup> April 2021, Presenting the university's strategy and plans to harmonize its academic programs, study plans, career transformation programs, and training programs with the needs of the labor market. ([https://www.mutah.edu.jo/Lists/News/Disp\\_Form.aspx?ID=198](https://www.mutah.edu.jo/Lists/News/Disp_Form.aspx?ID=198)).

In addition, many workshops have been held to develop self-employment capabilities.





2 ZERO HUNGER



## SDG2 ZERO HUNGER

According to Scopus data, the percentage of citations of Mutah's University scientific research increased by 107.5% in 2021 from 2020. Many scientific activities have been launched during 2021 in food security, such as Mutah University's agreement with food production companies (such as Al Kaseeh for food production) to enhance the workers in these companies with the most recent scientific and technological expertise.

Mutah University held a scientific workshop in cooperation with the Association of Agricultural Research Institutions in the Near East and North Africa (ARINENA) to stop food loss and waste, provide food security and enhance the capabilities of workers in the field of nutrition and agriculture. The Scientific Research Deanship has financially supported a project entitled "The Role of Cooperative Societies in Reducing Poverty and Unemployment Rates: A Case Study of Karak Governorate."

The proportion of agriculture and aquaculture graduates, including sustainability, has increased in 2021 to reach 4.54% of the total graduates. This indicates the increased awareness among the community and the university towards this vital field.

The College of Agriculture at Mutah University participated in the Third International Festival of Dates, held in Amman on Monday, 22/11/2021, by presenting a scientific symposium on the inputs and outputs of palm farms in Jordan and the role of Mutah University in providing expertise in palm cultivation.



## SDG3 GOOD HEALTH & WELLBEING



According to Scopus data, citations of Mutah University-affiliated research in healthcare and well-being increased in 2021 by 151.3% from the previous year. The College of Medicine, Pharmacy and Nursing continued its research efforts, which resulted in the students of the College of Medicine publishing scientific research on post-recovery syndrome from Corona virus-19 under the supervision of Prof. Waqar Al-Qubaisi, which is an unprecedented achievement in Jordan and Middle East as six risk factors were identified that lead to post-coronavirus. As well as, a research team at the Faculty of Medicine at Mutah University conducted a qualitative and unique study on the secretion of a particular enzyme from the cytochrome family in patients with uterine cancer and how to exploit this enzyme in treatment by activating compounds that treat uterine cancers. The research was entered into the Encyclopedia as the first research on uterine cancers.



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### CERTIFICATE OF ACCEPTANCE



Certificate of acceptance for the manuscript (*curroncol-1352391*) titled:  
Cytochrome 4Z1 expression is correlated with poor prognosis in patients with cervical cancer

Authored by:

Yousef M Al-saraireh; Fatemah OFO Alshammari; Ahmed MM Youssef; Yahya M AL-sarayra;  
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Yanal S Al-mahdy; Ahlam M Al-Kharabsheh; Seham M Abufraijeh; Hamzeh Mohammad Alrawashdeh

has been accepted in *Curr. Oncol.* (ISSN 1718-7729) on 11 September 2021



Basel, September 2021



Many Healthcare activities were provided to the local community, such as a visit to the poorest and unserved areas in the region, such as Ghor Assafi and A'i.



A memorandum of understanding was signed between Mutah University and the Institute for Family Health Care of the Noor Al Hussein Foundation to enhance joint cooperation between the two parties in various social and humanitarian fields and exchange information and experiences on issues of common interest. It also contained a scientific day on the latest medical developments in the epidemiological situation of the COVID-19 pandemic in Jordan and vaccination options. Moreover, Mutah University has opened a center to provide vaccines against the Covid-19 virus and has organized several workshops for students of health colleges to train in delivering vaccines.



## SDG4 QUALITY EDUCATION



To face the challenges imposed by the spread of the COVID-19 pandemic, Mutah University has signed a cooperation agreement with the Pioneers Training Academy in the field of joint training courses and the establishment of a collaborative platform for distance training to be equipped with courses and training programs and in various information technology disciplines with live broadcasting techniques for the student to benefit from in the development and development of his specialization and other skills, especially with the increasing need for Development of training and distance education.

The Center for E-Learning and Learning Resources was established at Mutah University in (2021), to be the university's main tributary of the educational process. The university administration believes that the e-learning system is one of the components of contemporary life and that the use of modern technology in education facilitates the educational process; So it is characterized by flexibility and helps to create an effective learning environment.

الموقع الإلكتروني: [mutah.edu.jo/ar/ELCenter/Pages/CenterBrochures.aspx](http://mutah.edu.jo/ar/ELCenter/Pages/CenterBrochures.aspx)

جامعة مؤتة :: نحو بيئة تعليمية أفضل

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مركز التعليم الإلكتروني ومصادر التعلم

الرئيسية | عن المركز | خدماتنا | الاخبار | أسئلة متكررة | الخدمات الإلكترونية | المحتوى الإلكتروني | الأدلة والنماذج | التعليمات | إتصل بنا

### أدلة العودة الامنة الى الحرم الجامعي

خارطة طريق العودة لمؤسسات التعليم العالي للعام الجامعي 2021-2022

الإجراءات المقترحة لعودة الطلبة للجامعة للفصل الأول من العام الجامعي 2021-2022

برنامج اللقاءات التوضيحية الخاصة بالعودة الى الحرم الجامعي الموجهة لجميع أعضاء هيئة التدريس في الجامعة.

دليل التعلم الإلكتروني ومصادر التعلم.

الأدلة التعليمية (فيديوهات)

Educational cooperation between Mutah University and the Ministry of Health transforms Karak Governmental Hospital into a teaching hospital. This cooperation works to provide educational

and training opportunities for doctors accepted in the higher specialization program at Mutah University, support medical and clinical research, encourage joint research between the ministry, and emphasize the concept of continuing medical education.

Mutah University held a training course related to the Lovas Lists (APA) for workers with children with disabilities, intending to serve the community in a manner commensurate with the university's vision and philosophy, especially for people with special needs and their families.

[https://www.mutah.edu.jo/Lists/News/Disp\\_Form.aspx?ID=235](https://www.mutah.edu.jo/Lists/News/Disp_Form.aspx?ID=235).

Mutah University launched the professional diploma for preparing and qualifying teachers to develop the educational training process for teachers before they start serving through a certificate that combines practical training and theoretical courses. The diploma aims to promote interactive education and test creative learning and teaching concepts through efficient practice in the classroom and face-to-face and electronic academic courses. This diploma focuses on undergraduate students and graduates within the majors of Arabic, English, Mathematics, and Science and their branches.

Mutah University held the Jordanian Education Renaissance Conference in One Hundred Years, which aimed to research and study education in Jordan during the first centenary. Scientific and educational sector.







## SDG5 GENDER EQUALITY

Queen Rania Al Abdullah Center for Educational and Psychological Studies has introduced more than three workshops and initiatives to bridge the gap in the field of female employment and to empower women in their role in building society. In 2021, the training courses targeted the local community. They cooperated with external lecturers to intensify the efforts to promote psychological and cultural awareness among individuals in the campus environment and the local community. <https://www.mutah.edu.jo/ar/qrc/Home.aspx>

The percentage of female academic staff considerably increased in 2021 compared to past years, and the number of female scholarship students reached 45 in 2021. Females in university executive positions have increased during 2021 to reach 55 persons. Female to Male student percentage remained the same this year with a value of 55:45.



The Department has approved more than 5 Ph.D. and Master theses in Social science this year. This Department continued to provide courses for Bachelor's degrees and specialized courses for higher education studies.

<https://www.mutah.edu.jo/ar/social/Documents/Theses.pdf>

According to Scopus data, the citation of Mutah research in this field doubled in 2021 compared to 2020. Moreover, the deanship of scientific research provided financial support project that addresses diversity and gender equality in the Jordanian context. As well as, the percentage of female researchers published in The Journal of Mu'tah Lil-Buḥūth wad-Dirāsāt (Humanities and Social Sciences) has reached 30% of the total researchers. It plans to increase the ratio and motivate female researchers to participate in publishing more and more. Many researches have been supported by the Deanship of Scientific Research, such as" Marital compatibility and its relationship to psychological flexibility and professional motivation among workers in the health sector."





# SDG6 CLEAN WATER AND SANITATION



During 2021, the Deanship of Scientific research has financially supported more than four projects in the field of the quality of drinking water and sanitation from the Chemical Engineering and Chemistry Departments, such as "study on the chemical and physical and biological changes in drinking water quality during a supplying process from source to consumer Al Karak water distribution system as a case study." Scopus data has shown that citations in this field are improving, and the number of publications has increased significantly compared to the previous year.

Mutah University has applied tracking water consumption and modern monitoring systems concerned with recording consumption rates. The university adopted policies to rationalize water consumption and has strengthened these policies firmly and solidly. The university has rationalized the consumption amounts for individuals and services within the university to be within international standards. This is shown inside the university campus, as all internal facilities have consumption rationalization systems. A particular program is developed for irrigation and follow-up of water consumption.

Mutah University held the Third National Conference for Food and Pharmaceutical Industries.



More than 40 research and discussion papers were presented during the conference sessions with seven main themes: food, medicine, medical supplies, food quality and safety, and the development of the industrial sector and medical equipment. One of the conference's recommendations is to

encourage the financial harvest, develop new types of crops resistant to drought and salinity, and settle horticultural crops that are more tolerant of heat.

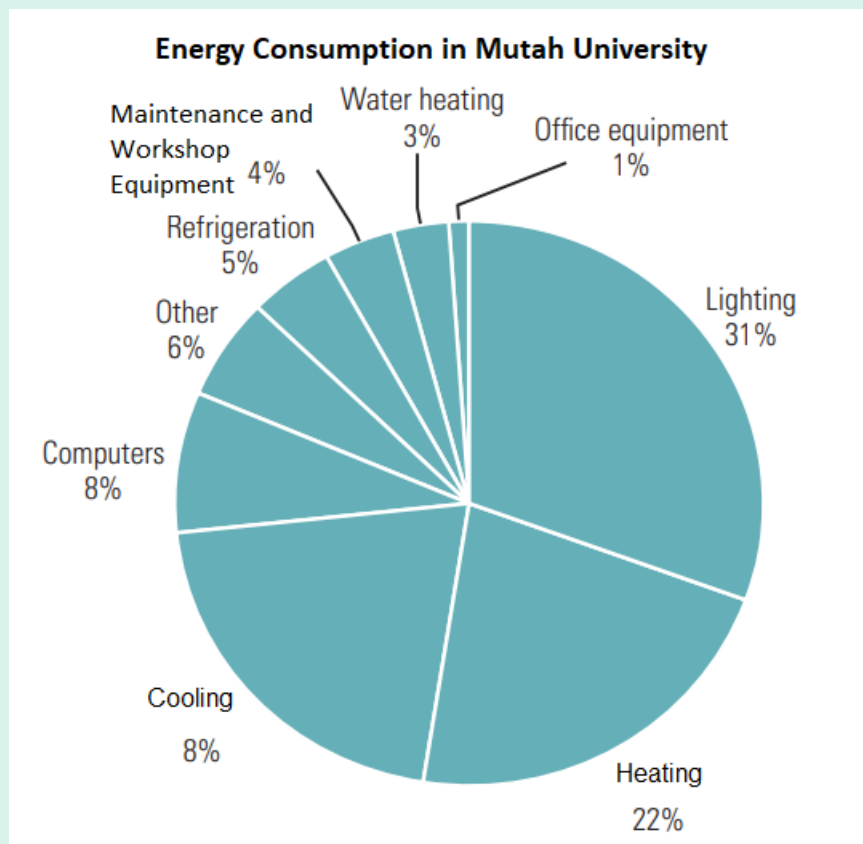
## SDG7 AFFORDABLE & CLEAN ENERGY



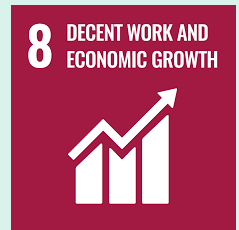
The Deanship of Scientific Research has initiated efforts to issue the Jordan Journal of Energy. The issue is expected to appear in the mid of 2022. According to Scopus data, citations and publications have increased significantly during 2021.

COVID-19 has significantly impacted the consumption of energy on campus. For 2021, the electric energy consumption has been calculated as 4604 MWh and 0.178% energy ratio to the area. Mutah University has continued its programs to rationalize energy consumption by reducing the inefficient and excessive energy consumption of external lighting systems on the university campus. Moreover, the usage of LEDs instead of aging conventional lamps resulted in a considerable reduction in energy consumption on the campus.

It was noticed that the number of electric cars increased in the Al Karak region, and several university employees participated in training courses on the subject of hybrid cars. Recently, some articles have started to include energy consumption assessments and other sustainability indicators, such as the carbon footprint. In the university context, traveling styles and the potential of cycling and walking have been noticeably considered.



## SDG8 DECENT WORK & ECONOMIC GROWTH



The citations of Mutah's University research on decent work and economic growth increased by 25.45% in 2021 compared to 2020. At the same time, publication in this important field has experienced a considerable increase.

Mutah University continued developing best employment practices for staff and faculty members. The University is committed to paying all employees, staff, and faculty what they deserve in compliance with the Jordanian local living wage laws. Moreover, the university is transparent with all its employees (faculty and staff) about their employment rights following Jordanian labor laws. Mutah university has a zero-tolerance policy for any discrimination at work. Accordingly, it has a policy on pay scale equity, including its commitment to measuring and eliminating gender pay gaps and ensuring equal pay for both male and female faculty and staff.

Mutah University has a strong retention rate of over 95% and a good level of faculty satisfaction. Moreover, the university president greets the faculty for the new academic year. The university spends JD 48 million yearly on its staff (90 percent of the balance sheet). Mutah University is committed to providing a safe and secure work environment. Over 95% of all MU academic and non-academic staff have worked for more than 24 months, reflecting a high level of job security.



## SDG9 INDUSTRY, INNOVATION & INFRASTRUCTURE



Publications of Mutah University in the field of industry and innovation have considerably increased this year, with a percentage of 9000% compared to the previous year. This indicates the efforts made have been successful in achieving the plans developed.

The Council of Deans has adopted the intellectual Property Policy; potential patents are under investigation to be claimed.

Patent agreements have been signed by a researcher who got support from the university.

Mutah University has established the Renewable Energy Laboratory of the (IREEDER) project, which aims to develop courses in electrical engineering, renewable energy, the Internet of things and its applications, and how to protect information. Providing specialized software for students of the electrical Department and the college.



The research income from the industry has increased by (+2%). The number of academic staff by subject area (STEM) has experienced an increase of 2%, whereas, in clinical and health, the percentage of increase approached 1% compared to arts and humanities, which achieved a 0.5% increase compared to the previous year. It is noted that some healthcare colleges have a significant role in this increase which could be justified by the spread of the COVID-19 pandemic and the many projects populated around it.



## SDG10 REDUCE INEQUALITIES



The percentages of students from developing countries and low-income level or middle-income levels increased by 1% during 2021. Mutah University allocated 10% of new student acceptance to international students. Mutah University has continued its efforts to improve access percentage from poor socioeconomic origins or refugee backgrounds as part of its commitment to meeting its duties to achieve similar results. This expansion of opportunity also extends globally, with many of our international students coming from low- or low-middle-income nations. Fee-reduction grants are often available to these students. The significance of this initiative is reflected in the University's market share in several of the largest of these countries' marketplaces (Iraq, Malaysia, Philippines, Indonesia, and Syria).

One hundred students at Mutah University are identified with one or more disabilities. The university offers extraordinary facilities to all its students without additional cost, one of which is a hotline service. Also, every building is equipped for these students. Moreover, the Deanship of Students affairs through the "Division for the care of people with special needs" (<https://www.mutah.edu.jo/ar/studentaffairs/Pages/DisabilitiesCare.aspx>) played an essential

role in facilitating all the procedures to encourage this section to complete their studies and to participate effectively in the activities of the university. Mutah University has ten academics who are identified with one or more disabilities. Handicapped parking slots for all disabled staff members are provided.



Also, every building is equipped for these staff members.



# SDG11 SUSTAINABLE CITIES & COMMUNITIES



In 2021, Mutah University published many articles related to Sustainable Cities and Communities. The sustainability action plan (2021-2025) has been developed and is in the process of acceptance by the Deans' Council.

Mutah University has modified its instruction to allow the local community access to facilities, such as the Library, drawing center, and heritage museum. During 2021, many activities have been developed to encourage the efforts to promote Jordanian cultural heritage, such as students visiting heritage villages in the Karak Governorate and Jordan and holding drawing workshops for archaeological and cultural landmarks such as the Karak Castle and the Jordanian poet Arar.



## SDG12 RESPONSIBLE CONSUMPTION & PRODUCTION



Research on responsible consumption and production: during 2021, Mutah University published many articles on this important topic. Many research projects have been supported either locally through Scientific Research Deanship or externally by many authorities and industries on the projects funded by the Scientific Research Fund/Ministry of Higher Education and Scientific Research is "Changing gasification technology and catalytic reforming technology to exploit biomass (peat olives) to produce renewable energy and chemicals."

Operational measures: during 2021, Mutah University reviewed its policies concerning Ethical sourcing policy, Waste Disposal – Hazardous Materials, Minimization of Plastic Use, and minimization of disposable items. Moreover, Mutah University ensures that such policies are extended to outsourced services and its supply chain members.

Mutah University held the third conference for the food and pharmaceutical industries, which aims to achieve food security and reduce waste in food and natural resource







## SDG13 CLIMATE ACTION

The 5th goal of the strategy of Mutah University is related to developing the efficiency and effectiveness of human, financial, and material resources. Mutah University has launched its Climate Action Plan 2021-2025, following its mission to develop sustainable development. Mutah University has financially supported many projects investigating Climate change during 2021, such as "Assessment of climate change impact on water resources in the region between Wadi Alwala and Rashadeah highlands."

**Low-carbon energy uses:** Mutah University is still achieving a high progress rate using its Low-Carbon action plans in this field. Many funded projects were directed toward investigating carbon emissions, selecting various options for working biofluids, and using PV-solar cells. Many articles and climate change have been published in this field with high citation scores.

**Environmental education measures.** It is noticed that the number of provided courses in this field has slightly increased since the study plan is not reviewed yearly. Still, Mutah University achieved a higher number of Master's Thesis tackling this vital topic.





## SDG14 LIFE BELOW WATER

Mutah University looks at all the national wealth in Jordan and the southern region. This emerged from the university's proximity to the Gulf of Aqaba, where the university conducted many studies on marine life through the Naval Research Station, which is clearly shown in the College of Agriculture Research Lists. The university organizes many scientific courses dealing with marine life and fishing in Aqaba and the system of agricultural ponds through specialized academic departments such as the Department of Animal Production in the College of Agriculture.

Mutah University has adopted many measures to protect and develop marine life, so it has participated in activities supporting the cleaning of the Gulf of Aqaba and its beaches, in addition to the great interest in the Dead Sea and the follow-up of scientific studies around it. Mutah University supports water stability at the university level and the level of Jordan in general, as the university includes a purification plant that purifies and filters water and uses it for agricultural purposes. It also supplies the farms of the area surrounding the university with water to a large extent. In addition, the university supports studies and research on water and the sustainability of its sources through its academic departments, such as the Department of Civil Engineering, Water and Environment, and the College of Agriculture in its various departments and some of its research centers.





## SDG15 LIFE ON LAND

Mutah University has encouraged research into land ecosystems through various courses and master's discussions in agricultural land use (the decline of green spaces). As well as holding scientific workshops through the College of Agriculture and the Center for Entrepreneurship and Innovation at the university to support the university's policy to make a green university

Mutah University has supported land ecosystems through education, as awareness campaigns have been conducted to increase the use of agricultural space, implement agricultural activities such as planting forest trees in empty spaces and involve students and workers in these activities. As well as carrying out systematic and non-curricular activities for students to clarify the importance of land and spaces within the campus and work to provide seedlings, trees, and seeds of excellent quality and at cheap costs.

Researchers at Mutah University have conducted many studies about life on Earth and the importance of agricultural land. These researches have been published in many international and regional journals, and the percentage of scientific citations of the research director in this field has increased. Many projects are supported by the Deanship of Scientific Research, such as The germination of date palm pollen grains, their vitality, the length of the pollen tube, and their tolerance to temperature fluctuations in response to some hormones, as in engineering research related to recycling.





## SDG16 PEACE, JUSTICE & STRONG INSTITUTIONS



Researchers at Mutah University have conducted many studies in leadership, governance, combating terrorism, strategic planning, and cybercrime due to the effectiveness of graduate programs in strategic management, criminology, political science, and Islamic law. Accordingly, the number of published papers in these areas has increased in conjunction with an increase in scientific citations significantly over previous years. As well as published research related to the study of the Covid-19 pandemic and its medical, social and economic effects.

The elected Union of Mutah University Students, under the auspices of the Deanship of Student Affairs through its various student bodies and clubs, embodies one of the important standards of governance and rational management of which Mutah University is concerned, which seeks to enhance human value, enhance the student's societal role and raise the degree of political awareness. Law and civil enforcement graduates account for 7% of all graduates at Mutah University.

Mutah University is committed to many policies related to academic freedom, integrity, combating corruption of all kinds,



and practicing democracy through the university's staff club, which is elected annually. Mutah University seeks to enhance transparency by publishing the financial statements and the annual budget within the approved functional bodies. The Internal Audit and Control Department promotes ethical values and principles in the performance of work at the university, in addition to achieving effective control over the university's funds and decisions by following the best control practices and professional standards and working independently and objectively.

# SDG17 PARTNERSHIPS FOR THE GOALS

17 PARTNERSHIPS  
FOR THE GOALS



Mutah University's mission is to achieve sustainable economic and social development translated into the university's regulations, procedures, and programs within and outside the campus.

Mutah University has achieved many achievements in the field of sustainable development during the year 2021, which was represented in the pioneering role played by the university during the Corona pandemic by opening a vaccination center for citizens and workers and training students of healthcare colleges to provide vaccinations. It has also undertaken many initiatives linking all sustainable development activities at the level of research, studies, courses, and work plans in addition to the social responsibility that the university undertook during the year 2021 by helping the less fortunate, consolidating human and cultural values, and preserving the human and cultural heritage in the Karak region.



## Publications indexed in Scopus by Mutah University during 2021 and the target SDG



Publication title	Authors	Publication year	Targeted SDG
Disparities in cesarean section among women in Jordan: analysis of the 2017–2018 Jordan Population and Family Health Survey (JPFHS) data	Al-Rawashdeh, I.   Kharboush, I.   Al-Kubaisy, W.	2021	SDG 1
Assessment and suitability study of landfills in Jordan, al-karak using geographic information systems (Gis)	Alsarayreh, H.K.   Alsarayreh, D.W.	2021	SDG 10   SDG 11
A techno-economic analysis of sustainable material recovery facilities: The case of Al-Karak solid waste sorting plant, Jordan	Al-Athamin, E.A.   Hemidat, S.   Al-Hamaiedeh, H.   Aljbou, S.H.   El-Hasan, T.   Nassour, A.	2021	SDG 11
Impact of Mu'tah University, Jordan on Urban Expansion and Demographic Growth in the Adjacent Areas, 1985–2021	Shogoor, S.S.   Almhadeen, E.A.	2021	SDG 11
Applications of GIS and remote sensing to detect the impact of urbanization in Al-Ees/Tafila on land-use changes during the period of (1979-2015)	Oran, A.H.   Al-Sagarat, O.	2021	SDG 11
Characterization of basalt for conservation use from cultural heritage site of Umm el-Jimāl in Jordan	Sekhaneh, W.A.   El-Hasan, T.	2021	SDG 11
The utility of combining optical and thermal images in monitoring agricultural drought in semiarid mediterranean environments	Oroud, I.M.   Balling, R.C.	2021	SDG 11



Composting of organic waste: A sustainable alternative solution for solid waste management in Jordan	Al-Nawaiseh, A.R.   Aljbour, S.H.   Al-Hamaiedeh, H.   El-Hasan, T.   Hemidat, S.   Nassour, A.	2021	SDG 11   SDG 12
Investigation of Energy Recovery from Municipal Solid Waste: A Case Study of Al-Karak City / Jordan	Al-Hajaya, M.   Aljbour, S.H.   Al-Hamaiedeh, H.   Abuzaid, M.   El-Hasan, T.   Hemidat, S.   Nassour, A.	2021	SDG 11   SDG 12
Anaerobic Co-Digestion of Domestic Sewage Sludge with Food Waste: Incorporating Food Waste as a Co-Substrate Under Semi-Continuous Operation	Aljbour, S.H.   Al-Hamaiedeh, H.   El-Hasan, T.   Hayek, B.O.   Abu-Samhadaneh, K.   Al-Momany, S.   Aburawaa, A.	2021	SDG 12
Microstructural, mechanical and physical assessment of portland cement concrete pavement modified by sodium acetate under various curing conditions	Al-Kheetan, M.J.   Ghaffar, S.H.   Awad, S.   Chougan, M.   Byzyka, J.   Rahman, M.M.	2021	SDG 12
THE DISCLOSURE OF THE CONTENT OF SUSTAINABILITY REPORTS AND ITS IMPACT IN INVESTORS DECISIONS IN JORDANIAN INDUSTRIAL PUBLIC SHARE HOLDING COMPANIES	Al-Amaedeh, Z.O.   Al-Hosban, A.A.	2021	SDG 12
Green cellular design using an adaptive power management redistribution for mobile communication	Alnawayseh, S.E.A.   Al-Zaghibeh, A.R.	2021	SDG 13
GC-mass determination for the biodegradative products of 2,6-dimethylpyridine using dead-sea bacterial isolate	Al-Hujran Tayel, A.   Magharbeh Mousa, K.   Al-Btoush Hayat, A.   Al-Ja'afreh Abdallah, A.   Yasser, G.	2021	SDG 14

Workplace violence among healthcare workers during COVID-19 pandemic in a Jordanian governmental hospital: the tip of the iceberg	Ghareeb, N.S.   El-Shafei, D.A.   Eladl, A.M.	2021	SDG 16
Mobile Government and Digital Economy Relationship and Challenges	Althunibat, A.   Alokush, B.   Tarabieh, S.M.   Dawood, R.	2021	SDG 16
Media in armed conflicts: Is it still a good idea?	Alshdaifat, S.A.   Hayajneh, A.M.	2021	SDG 16
RAPD analysis and field screening of bread wheat and barley accessions for resistance to cereal leafminer <i>Syringopais temperatella</i>	Ghabeish, I.H.   Al-Zyoud, F.A.   Hassawi, D.S.	2021	SDG 2
CURRENT STATUS, CHALLENGES, MANAGEMENT AND FUTURE PERSPECTIVES OF THE RED PALM WEEVIL <i>Rhynchophorus ferrugineus</i> OLIVIER (COLEOPTERA, CURCULIONIDAE) ERADICATION - A REVIEW	Al-Zyoud, F.   Shibli, R.   Ghabeish, I.	2021	SDG 2
Estimating the time point for nutritional failure in patients suffering from acute brain attacks in the intensive care unit	Al-Kalaldehy, M.   Shosha, G.A.   Shogirat, N.   Alsaraireh, M.   Haddadin, R.	2021	SDG 2
Assessment of groundwater quality for irrigation in the arid regions using irrigation water quality index (IWQI) and GIS-Zoning maps: Case study from Abu Dhabi Emirate, UAE	Batarseh, M.   Imreizeeq, E.   Tilev, S.   Al Alaween, M.   Suleiman, W.   Al Remeithi, A.M.   Al Tamimi, M.K.   Al Alawneh, M.	2021	SDG 2   SDG 3   SDG 6   SDG 15

Inhibitory effects of epigallocatechin gallate (EGCG) combined with zinc sulfate and silver nanoparticles on avian influenza A virus subtype H5N1	Saadh, M.J.   Aldalaen, S.M.	2021	SDG 3
Punicalagin and zinc (II) ions inhibit the activity of SARS-CoV-2 3CL-protease in vitro	Saadh, M.J.   Almaaytah, A.M.   Alaraj, M.   Dababneh, M.F.   Sa'Adeh, I.   Aldalaen, S.M.   Kharshid, A.M.   Alboghdadly, A.   Hailat, M.   Khaleel, A.   Al-Hamaideh, K.D.   Abu Dayyih, W.	2021	SDG 3
Hesitancy towards covid-19 vaccines: An analytical cross-sectional study	Aloweidi, A.   Bsisu, I.   Suleiman, A.   Abu-Halaweh, S.   Almustafa, M.   Aqel, M.   Amro, A.   Radwan, N.   Assaf, D.   Abdullah, M.Z.   Albataineh, M.   Mahasneh, A.   Badaine, A.   Obeidat, H.	2021	SDG 3
Pfizer-biontech and sinopharm: A comparative study on post-vaccination antibody titers	Alqassieh, R.   Suleiman, A.   Abu-Halaweh, S.   Santarisi, A.   Shatnawi, O.   Shdaifat, L.   Tarifi, A.   Al-Tamimi, M.   Al-Shudifat, A.-E.   Alsmadi, H.   Al Sharqawi, A.   Alnawaiseh, H.   Anasweh, Y.   Domaiah, F.A.   Jaber, H.A.   Al-Zarir, M.R.   Bsisu, I.	2021	SDG 3
Investigating students' behavioral intention to use mobile learning in higher education in UAE during Coronavirus-19 pandemic	Al-Hamad, M.Q.   Mbaidin, H.O.   Alhamad, A.Q.M.   Alshurideh, M.T.   Kurdi, B.H.A.   Al-Hamad, N.Q.	2021	SDG 3
Silver nanoparticles with epigallocatechingallate and zinc sulphate significantly inhibits avian influenza A virus H9N2	Saadh, M.J.   Aggag, M.M.   Alboghdadly, A.   Kharshid, A.M.   Aldalaen, S.M.   Abdelrazek, M.A.	2021	SDG 3
Cnicin as an anti-sars-cov-2: An integrated in silico and in vitro approach for the rapid	Alhadrami, H.A.   Sayed, A.M.   Hassan, H.M.   Youssif, K.A.   Gaber, Y.   Moatasim, Y.   Kutkat, O.   Mostafa, A.	2021	SDG 3

identification of potential covid-19 therapeutics	Ali, M.A.   Rateb, M.E.   Abdelmohsen, U.R.   Gamaleldin, N.M.		
Ten Antenna Array Using a Small Footprint Capacitive-Coupled-Shorted Loop Antenna for 3.5 GHz 5G Smartphone Applications	Aljaafreh, S.S.   Altarawneh, B.   Alshamaileh, M.H.   Almajali, E.R.   Hussain, R.   Sharawi, M.S.   Xing, L.   Xu, Q.	2021	SDG 3
A metabolomic approach to target antimalarial metabolites in the Artemisia annua fungal endophytes	Alhadrami, H.A.   Sayed, A.M.   El-Gendy, A.O.   Shamikh, Y.I.   Gaber, Y.   Bakeer, W.   Sheirf, N.H.   Attia, E.Z.   Shaban, G.M.   Khalifa, B.A.   Ngwa, C.J.   Pradel, G.   Rateb, M.E.   Hassan, H.M.   Alkhalifah, D.H.M.   Abdelmohsen, U.R.   Hozzein, W.N.	2021	SDG 3
A simulation model for forecasting covid-19 pandemic spread: Analytical results based on the current saudi covid-19 data	Hassanat, A.B.   Mnasri, S.   Aseeri, M.   Alhazmi, K.   Cheikhrouhou, O.   Altarawneh, G.   Alrashidi, M.   Tarawneh, A.S.   Almohammadi, K.   Almoamari, H.	2021	SDG 3
Changes in lactate production, lactate dehydrogenase genes expression and dna methylation in response to tamoxifen resistance development in mcf-7 cell line	Hamadneh, L.   Al-Lakkis, L.   Alhusban, A.A.   Tarawneh, S.   Abu-Irmaileh, B.   Albustanji, S.   Qader Al-Bawab, A.	2021	SDG 3
Hand movement-based diabetes detection using machine learning techniques	Al-Tarawneh, M.   Muheilan, M.   Al-Tarawneh, Z.	2021	SDG 3
Profiling of CYP4Z1 and CYP1B1 expression in bladder cancers	Al-saireh, Y.M.   Alshammari, F.O.F.O.   Youssef, A.M.M.   Al-Sarayreh, S.   Almuhaissen, G.H.   Alnawaiseh, N.   Al Shuneigat, J.M.   Alrawashdeh, H.M.	2021	SDG 3



Phytotherapeutic approaches and ethnopharmacological responses against covid-19	Al-Samydai, A.   Hajleh, M.A.   Akour, A.   Alabdallah, N.   Yousef, M.   Baqa'in, G.   Al-Saadi, A.   Al-Halaseh, L.K.   Aburjai, T.	2021	SDG 3
Branched chain amino acids as in vitro and in vivo anti-oxidation compounds	Alqaraleh, M.   Kasabri, V.   Al-Majali, I.   Aljaafreh, A.   Al-Othman, N.   Khleifat, K.   Al-tawarah, N.M.   Qaralleh, H.   Khwaldeh, A.S.   Alalawi, S.   Al Majali, M.	2021	SDG 3
Biliary tree neuroendocrine tumor, an incidental finding	Altiti, M.   Al-sa'afin, A.J.   Al-tawarah, T.   Suleihat, A.   Abulhaj, S.   Mahseeri, M.	2021	SDG 3
Foot ulcers associated with external trauma among people with diabetes: An integrative review of the origin of trauma and outcomes	Abu-Qamar, M.Z.   Kemp, V.   Whitehead, L.	2021	SDG 3
Cytochrome 4z1 expression is associated with poor prognosis in colon cancer patients	Al-Saireh, Y.M.   Alshammari, F.O.F.O.   Youssef, A.M.M.   Al-Sarayreh, S.   Almuhaissen, G.H.   Alnawaiseh, N.   Al-Shuneigat, J.M.   Alrawashdeh, H.M.	2021	SDG 3
Cytochrome 4z1 expression is correlated with poor prognosis in patients with cervical cancer	Al-Saireh, Y.M.   Alshammari, F.O.F.O.   Youssef, A.M.M.   Al-Sarayra, Y.M.   Al-Saireh, R.A.   Al-Muhaissen, G.H.   Al-Mahdy, Y.S.   Al-Kharabsheh, A.M.   Abufraijeh, S.M.   Al-Rawashdeh, H.M.	2021	SDG 3
Evaluation of the antiglycation effect of branched chain amino acids and phytochemical compounds on raw 264.7 cell line and their synergistic effect on colorectal cancer cell line panel	Alqaraleh, M.   Kasabri, V.   Aljaafreh, A.   Al-Majali, I.   Al-Othman, N.   Khleifat, K.   Khaleel, S.   Al-tawarah, N.M.   Qaralleh, H.   Al-Majali, M.   Yousef, I.   Al-Khatib, A.   Khwaldeh, A.S.	2021	SDG 3
Biodegradation of phenol by bacillus simplex: Characterization and kinetics study	Magharbeh, M.K.   Khleifat, K.M.   Al-Kafaween, M.A.   Saireh, R.   Alqaraleh, M.   Qaralleh, H.   Al-Tarawneh, A.   Al-Limoun, M.O.   El-Hasan, T.   Hujran, T.	2021	SDG 3

	Ajbour, S.H.   Jarrah, N.   Amonov, M.   Al-Jamal, H.A.N.		
Folic acid-hydrophilic polymer coated mesoporous silica nanoparticles target doxorubicin delivery	Al-Nadaf, A.H.   Dahabiyeh, L.A.   Jawarneh, S.   Bardaweel, S.   Mahmoud, N.N.	2021	SDG 3
Phytochemical and anti-cancer properties of Euphorbia hierosolymitana Boiss. crude extracts	Al-Saraireh, Y.M.   Youssef, A.M.M.   Alsarayreh, A.Z.   Al Hujran, T.A.   Al-Sarayreh, S.   Al-Shuneigat, J.M.   Alrawashdeh, H.M.	2021	SDG 3
Growth Kinetics and Toxicity of Pseudomonas fredriksbergensis Grown on Phenol as Sole Carbon Source	Aljbour, S.H.   Khleifat, K.M.   Tarawneh, A.A.   Asasfeh, B.   Qaralleh, H.   El-Hasan, T.   Magharbeh, M.K.   Al-Limoun, M.O.	2021	SDG 3
Central pancreatectomy for solid pseudopapillary neoplasm: A pancreatic-preserving procedure	Mahseeri, M.   Alqaiseieh, A.   Alkhader, D.   Halbony, H.   Albreazat, M.   Abualhaj, S.	2021	SDG 3
Patients response to pre-operative counseling for the appropriate type of bariatric surgery	Rashdan, M.Z.   Nofal, M.N.   Yousef, A.J.   Abuhemeidan, J.H.   Al-Taher, R.N.   Suleihat, A.S.   Alwazzan, S.A.   Alshaiji, R.A.   Husami, R.Y.   Abu Alhuda, R.F.	2021	SDG 3
Synthesis and cytotoxicity of thieno[2,3-b]pyridine derivatives toward sensitive and multidrug-resistant leukemia cells	Al-Trawneh, S.A.   Tarawneh, A.H.   Gadetskaya, A.V.   Seo, E.-J.   Al-Ta'Ani, M.R.   Al-Taweel, S.A.   El-Abadelah, M.M.	2021	SDG 3
Effect of fluoxetine on the testes of adult albino rats and the possible protective role of curcumin	Elsedawi, B.F.   Hussein, Y.   Sabry, M.A.   Aziz, J.A.	2021	SDG 3
Fear of covid-19 among the hashemite university students according to some variables	Alkhazaleh, Z.M.   Altarawneh, A.F.   Al-Tarawneh, A.   Milhem, O.A.Q.B.	2021	SDG 3

Cytochrome 4Z1 expression is associated with unfavorable survival in triple-negative breast cancers	Al-Saraireh, Y.M.   Alshammari, F.O.F.O.   Youssef, A.M.M.   Al-Tarawneh, F.   Al-Sarayreh, S.   Almuhausen, G.H.   Satari, A.O.   Al-Shuneigat, J.   Alrawashdeh, H.M.	2021	SDG 3
Chemical composition, antioxidant and inhibitory effect of cupressus sempervirens essential oils and methanolic extract on beta-lactamase producing isolates	Qaralleh, H.   Khleifat, K.M.   Khlaifat, A.M.   Al-Limoun, M.   Al-Tawarah, N.M.   Alhroob, A.M.   Alsaudi, A.B.	2021	SDG 3
COVID-19 knowledge amongst dentists and evaluation of the dental infection prevention protocol	Alzoubi, H.   Abu-Helalah, M.   Alshraideh, H.   Alkhasawneh, M.	2021	SDG 3
Prevalence and factors related to obesity and fast food consumption among Mutah University students, Jordan	Mwafi, N.R.   Al-Rawashdeh, I.M.   Al-Kubaisy, W.A.-Q.   Ezzat, W.R.   Al-Qazaqi, R.A.   Salameh, M.H.	2021	SDG 3
Clinical care pathway program versus open-access system: a study on appropriateness, quality, and efficiency in the delivery of colonoscopy in the colorectal cancer	Del Vecchio Blanco, G.   Dwairi, R.   Giannelli, M.   Palmieri, G.   Formica, V.   Portarena, I.   Grasso, E.   Di Iorio, L.   Benassi, M.   Giudice, E.A.   Nardecchia, A.   Rossi, P.   Roselli, M.   Sica, G.   Monteleone, G.   Paoluzi, O.A.	2021	SDG 3
Phytochemical characterization and anti-cancer properties of extract of Ephedra foeminea (Ephedraceae) aerial parts	Al-Saraireh, Y.M.   Youssef, A.M.M.   Alshammari, F.O.F.O.   Al-Sarayreh, S.A.   Al-Shuneigat, J.M.   Alrawashdeh, H.M.   Mahgoub, S.S.	2021	SDG 3
Glypican-1 overexpression in different types of breast cancers	Alshammari, F.O.F.O.   Al-Saraireh, Y.M.   Youssef, A.M.M.   Al-Sarayra, Y.M.   Alrawashdeh, H.M.	2021	SDG 3

Phytochemistry and Antiviral Properties of Two Lotus Species Growing in Egypt	Youssef, A.M.M.   El-Swaify, Z.A.S.   Maaty, D.A.M.   Youssef, M.M.	2021	SDG 3
Antibiotic Misuse during COVID-19 Pandemic: Review Study	Kharshid, A.M.   Saadh, M.J.   Taani, R.I.   Aldmour, D.M.   Dayyih, W.A.	2021	SDG 3
Different optimization conditions required to enhance the reduction potential of silver nanoparticle biosynthesis via the Mycelia-free filtrate step using the fungus <i>Aspergillus flavus</i>	Khleifat, K.M.   Qaralleh, H.   Al-Kafaween, M.A.   Al-Limoun, M.O.   Alqaraleh, M.   Sabha, A.E.A.   Shadid, K.A.   Alqaisi, K.   Buqain, R.A.   Karamah, N.   Nagi Al-Jama, H.A.   Amonov, M.   Abed, A.	2021	SDG 3
Screening of Glypican-6 Expression in Benign, Primary and Metastatic Colon Cancers	Al-Saraireh, Y.M.   Alshammari, F.O.F.O.   Youssef, A.M.M.   Al-Sarayreh, S.   Al-Sarayra, Y.M.   Aborajooh, E.   Al-Shuneigat, J.   Alrawashdeh, H.M.	2021	SDG 3
Chitosan and alginate salt as biomaterials are potential natural adjuvants for killed cholera vaccine	AbdelAllah, N.H.   Gaber, Y.   AbdelGhani, S.   Rashed, M.E.   Azmy, A.F.	2021	SDG 3
Conjunctivitis as the only sign and symptom of COVID-19: A case report and review of literature	Alrawashdeh, H.M.   Zubi, K.A.   Abdulmannan, D.M.   Al-Hababbeh, O.   Abu-Ismael, L.	2021	SDG 3
Nurses' perceived knowledge and benefits of artificial nutrition and hydration for patients nearing death: A survey among Jordanian nurses	Mosleh, S.   Alnajar, M.   Almalik, M.M.	2021	SDG 3
Effect of irisin on metabolic and platelet functions in type 2 diabetic rats: role of soluble receptor of advanced glycation end products (sRAGE)	Mansour, S.W.   Hasan, M.M.   Salah, H.E.   El-Deep, T.   Hussein, S.   El-Malkey, N.F.	2021	SDG 3



Ononis natrix l. Lowers the blood glucose concentration in wistar rats with streptozotocin-induced diabetes mellitus	Al-Mubideen, B.F.   Al-Serhan, A.-A.A.   Amarin, J.Z.   Al-Dweikat, A.   Al-Muhaisen, R.Z.   Shreikh, Y.A.   Suradi, H.H.   Al-Ameer, H.J.   Zihlif, M.A.	2021	SDG 3
Microbial etiologies of ventilator-associated pneumonia (VAP) in intensive care unit of Beni-Suef University's Hospital	Maebed, A.Z.M.   Gaber, Y.   Bakeer, W.   Dishisha, T.	2021	SDG 3
Acute acalculous cholecystitis in a child with hepatitis A infection	Tarawneh, A.   Alkhatib, A.M.   AL-Namorah, B.A.	2021	SDG 3
The Lived Experience of Jordanian Parents of Children with Cystic Fibrosis: Qualitative Study	AlAdaileh, A.G.   Obeidat, H.M.   Khamaiseh, A.   AlNawafleh, A.H.   Mahasneh, D.   Froelicher, E.S.	2021	SDG 3
Association between Grain and Legume Consumption and the Risk of Coronary Artery Obstruction among Jordanians Based on Angiography Results	Tayyem, R.   Ibrahim, M.O.   Abdelrahim, D.N.   Al-Shudifat, A.-E.   Azab, M.   Ghazzawi, H.   Bawadi, H.	2021	SDG 3
Simultaneous detection of chlamydia pneumoniae, mycoplasma pneumoniae, and legionella pneumophila in patients hospitalised for community-acquired pneumonia in south jordan	Al-Zereini, W.A.	2021	SDG 3
Initial optimal medical therapy with or without invasive strategy for stable coronary disease: A meta-analysis and systematic review	Barbarawi, M.   Alabdouh, A.   Barbarawi, O.   Lakshman, H.   Alkasasbeh, M.   Khallad, M.   Radaideh, Q.	2021	SDG 3
Influence of castor oil on glycated hemoglobin (Hba1c) on induced type 2 diabetes mellitus in rats	Dayyih, W.A.   Manaysa, M.H.   Hailat, M.M.   Zakareia, Z.   Hajji, F.E.	2021	SDG 3

Multidrug-resistant bacterial profile and patterns for wound infections in nongovernmental hospitals of Jordan	Abu-Harirah, H.A.   Al Qudah, A.J.   Daabes, E.   Amawi, K.F.   Qaralleh, H.	2021	SDG 3
Frequency of mismatch repair protein deficiency and PD-L1 in high-grade gliomas in adolescents and young adults (AYA)	Almuhaisen, G.   Alhalaseh, Y.   Mansour, R.   Abu-Shanab, A.   Al-Ghnimat, S.   Al-Hussaini, M.	2021	SDG 3
Corticosteroids and severe COVID 19 patients; is there any hope?	Alshgoor, B.A.   Alnawaiseh, N.	2021	SDG 3
Efficacy of face masks against respiratory infectious diseases: A systematic review and network analysis of randomized-controlled trials	Tran, T.Q.   Mostafa, E.M.   Tawfik, G.M.   Soliman, M.   Mahabir, S.   Mahabir, R.   Dong, V.   Ravikulan, R.   Alhijazeen, S.   Farrag, D.A.   Dumre, S.P.   Huy, N.T.   Hirayama, K.	2021	SDG 3
Upregulation of miR-33 and miR-155 by gum acacia mitigates hyperlipidaemia and inflammation but not weight increase induced by Western diet ingestion in mice	Hussein, R.M.	2021	SDG 3
Computerized assessment of horizontal hand skew for normal subjects compared to diabetics	MUHEILAN, M.   AL TARAWNEH, Z.A.	2021	SDG 3
Antibiotic stewardship in ICU during covid-19	Saadh, M.J.   Kharshid, A.M.   Aladailah, H.K.   Abunawas, S.   Dayyih, W.A.	2021	SDG 3
Honey-Based Extracts and Their Microemulsions in the Treatment of Liver and Breast Cancers	Altaweel, R.   Lafi, A.   Ebrahim, W.   Ebada, S.S.   Nasr, M.	2021	SDG 3
Evaluation of anti-inflammatory activity of methanol extract of Rhus Coriaria L. In diabetic rats	Alsarayreh, A.Z.   Oran, S.A.   Shakhanbeh, J.M.	2021	SDG 3

Investigation into the prophylactic and therapeutic activity of coenzyme Q10 against COVID-19	AL-Samydai, A.   Abu Hajleh, M.N.   Akour, A.   Shalan, N.   Jaber, N.   Al-Halaseh, L.K.   Alzweiri, M.	2021	SDG 3
IoT E-Waste Monitoring System to Support Smart City Initiatives	Ali, N.A.L.   Ramly, R.   Sajak, A.A.B.   Alrawashdeh, R.	2021	SDG 3   SDG 11   SDG 12
Assessment of the awareness, perception, attitudes, and preparedness of health-care professionals potentially exposed to COVID-19 in the United Arab Emirates	Dalky, H.F.   Ghader, N.   Kuwari, M.A.   Alnajar, M.   Ismaile, S.   Almalik, M.   Shudifat, R.   Sanad, S.   Al-Nsair, N.   Matrooshi, F.A.	2021	SDG 3   SDG 16
“From the classroom to Dr. YouTube”: nursing students' experiences of learning and teaching styles in Jordan	MAHASNEH, D.   SHOQIRAT, N.   SINGH, C.   Hawks, M.	2021	SDG 3   SDG 4
From Learning on Mannequins to Practicing on Patients: Nursing Students' First-Time Experience of Clinical Placement in Jordan	Mahasneh, D.   Shoqirat, N.   Alsaraireh, A.   Singh, C.   Thorpe, L.	2021	SDG 3   SDG 4
Sexual educational needs of Jordanian women after giving birth	Alnuaimi, K.   Almalik, M.	2021	SDG 3   SDG 4   SDG 5
Dataset for the physio-chemical parameters of groundwater in the Emirate of Abu Dhabi, UAE	Batarseh, M.   Imreizeeq, E.   Tilev, S.   Al Alaween, M.   Suleiman, W.   Al Remeithi, A.M.   Al Tamimi, M.K.   Al Alawneh, M.	2021	SDG 3   SDG 6
Occupational burnout and job satisfaction among physicians in times of COVID-19 crisis: a convergent parallel mixed-method study	Alrawashdeh, H.M.   Al-Tammemi, A.B.   Alzawahreh, M.K.   Al-Tamimi, A.   Elkholy, M.   Al Sarireh, F.   Abusamak, M.   Elehamer, N.M.K.   Malkawi, A.   Al-Dolat, W.   Abu-Ismaail, L.   Al-Far, A.   Ghoul, I.	2021	SDG 3   SDG 8
Pain assessment and management in intensive care	Alnajar, M.Kh.   Shudifat, R.   Mosleh, S.M.   Ismaile, S.   N'erat, M.   Amro, K.	2021	SDG 4

unit: Nurses' practices, perceived influencing factors, and educational needs			
The Degree to which the Directorate of Education's School Teachers in Karak Governorate have the Skills to Develop the Concepts of Entrepreneurship and Innovation from their Point of View	Al-Sou'b, M.M.   Tarawneh, R.A.A.A.-S.	2021	SDG 4
Perceptions and Views of Financial managers and Auditors on Creative accounting Practices, Motives, and Impact on Financial Reporting Quality: Evidence from Jordan	Aldahiyat, M.   Dahiyat, A.   Sarayreh, A.   Abed, S.A.   Tkryty, I.	2021	SDG 4
Factors motivating virtual lab simulations adoption in secondary school physics instruction in jordan	Jaradat, S.M.   Mousa, M.S.   Dunn, D.   Reason, C.	2021	SDG 4
Women in surgery: A systematic review of 25 years	Singh, C.   Loeth, C.   Shoaqrat, N.	2021	SDG 4   SDG 5
Radical thoughts: Fears about and supporting ISIS among Jordanian college students	Al-Badayneh, D.M.   Almawajdeh, M.A.   Al-Enazi, A.T.	2021	SDG 5   SDG 16
Biosorption of chromium and nickel from aqueous solution using pine cones, eucalyptus bark, and moringa pods: A comparative study	Matouq, M.   Saleh, M.   Al-Ayed, O.   El-Hasan, T.   Hiroshi, Y.   Tagawa, T.	2021	SDG 6
Comparative performance study of ZnCl <sub>2</sub> and NaOH sludge based activated carbon for simultaneous	Liadi, M.A.   Mu'azu, N.D.   Jarrah, N.   Zubair, M.   Alagha, O.   Al-Harathi, M.A.   Essa, M.H.	2021	SDG 6



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Statistical analysis of flash flood events for designing water harvesting systems in an extremely arid environment	Unami, K.   Mohawesh, O.   Fadhil, R.M.	2021	SDG 6
Assessment of polycyclic aromatic hydrocarbon in runoff from different land use at Amman Zarqa Basin-Jordan	Al-Mashaqbeh, O.O.   Jiries, A.G.   El Haj Ali, Z.Z.	2021	SDG 6
Productivity enhancement of the solar still by using water cooled finned condensing pipe	Al-Dabbas, M.   Alahmer, A.   Mamkagh, A.   Gomaa, M.R.	2021	SDG 6   SDG 7
WTiO <sub>2</sub> photocatalysis for the transformation of aromatic water pollutants into fuels	Al-Madanat, O.   Alsalka, Y.   Ramadan, W.   Bahnemann, D.W.	2021	SDG 6   SDG 7
The impact of wind generation on low frequency oscillation in power systems	Almomani, M.M.   Odienat, A.   Al-Gharaibeh, S.F.   Alawasa, K.	2021	SDG 7
Investigation of the energy output from PV panels based on using different orientation systems in Amman-Jordan	Alrwashdeh, S.S.	2021	SDG 7
The enhancement of frequency stability of low inertia interconnected power system	Al-Odienat, A.   Al-Maitah, K.   Al-Khraisat, B.	2021	SDG 7
Photocatalytic h <sub>2</sub> production from naphthalene by various tio <sub>2</sub> photocatalysts: Impact of pt loading and formation of intermediates	Al-Madanat, O.   Alsalka, Y.   Dillert, R.   Bahnemann, D.W.	2021	SDG 7

Residential Electrical Water Heater Energy Efficiency Monitoring system	Almajali, Z.	2021	SDG 7
Particle Swarm Optimizer for BESS Operation to Mitigate Voltage Deviation of the Modified IEEE 9-bus Power System	Al-Maaitah, S.S.   Al-Majali, H.D.	2021	SDG 7
Boosting the h2 production efficiency via photocatalytic organic reforming: The role of additional hole scavenging system	Alsalka, Y.   Al-Madanat, O.   Hakki, A.   Bahnemann, D.W.	2021	SDG 7
Improved qca-based full adder/subtractor structures	Altarawneh, Z.   Al-Tarawneh, M.	2021	SDG 7
C-element design in quantum dot cellular automata	Al-Tarawneh, M.   Altarawneh, Z.A.	2021	SDG 7
Overview on the vital step toward addressing platinum catalyst poisoning mechanisms in acid media of direct ethanol fuel cells (DEFCs)	Altarawneh, R.M.	2021	SDG 7
Energy management and control in micro grid with hybrid energy storage systems by using PI and flatness theory	Mohammed, M.S.   Al-Awasa, K.M.   Al-Majali, H.D.	2021	SDG 7
Discomfort monitoring system for residential electrical water heater	Almajali, Z.	2021	SDG 7
Application of EPR spectroscopy in TiO2 and Nb2O5 photocatalysis	Al-Madanat, O.   Nunes, B.N.   Alsalka, Y.   Hakki, A.   Curti, M.   Patrocinio, A.O.T.   Bahnemann, D.W.	2021	SDG 7
Article experimental study on the effect of dust deposition on a car park photovoltaic system with different cleaning cycles	Alawasa, K.M.   Alabri, R.S.   Al-Hinai, A.S.   Albadi, M.H.   Al-Badi, A.H.	2021	SDG 7

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Comparative study on the effect of the absorber geometry, rim angle and operational modes on the distribution of the heat flux over the absorber's surface	Altarawneh, I.   Alnaief, M.   Mohammad, B.   Tarawneh, M.	2021	SDG 7
Performance Analysis of Active Islanding Detection Method for Grid Connected Inverter	Al-Shamaileh, M.H.   Al-Majali, H.D.	2021	SDG 7
Parametric Study on the Performance of Combined Power Plant of Steam and Gas Turbines	Almajali, M.R.   Quran, O.A.S.	2021	SDG 7
The functioning of the hybrid integrated partially solar-vapor-compression fridge	Al-Dabbas, M.A.A.	2021	SDG 7
The description of “Temperature self-limiting” in Jordanian solar generators with natural cooling	Ali Al-Dabbas, M.A.	2021	SDG 7
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Arbiter design based on quantum dot cellular automata	Altarawneh, Z.   Al-Tarawneh, M.	2021	SDG 7

Animal solid waste as a potential renewable biomass energy source: a case study of Jordan	Alnhoud, O.T.   Al-Harashsheh, A.M.   Al-Harashsheh, M.S.   Irshaid, F.I.	2021	SDG 7   SDG 11   SDG 12
Economic and environmental impact of construction and demolition in green buildings: A case study of Jordan	Albaali, G.   Shahateet, M.I.   Daoud, H.-E.   Saidi, A.G.	2021	SDG 7   SDG 8   SDG 12
On the nexus of CO2 emissions and renewable and nonrenewable energy consumption in Europe: A new insight from panel smooth transition	Alqaralleh, H.	2021	SDG 7   SDG 8   SDG 13
Functionalized graphene-based nanocomposites for smart optoelectronic applications	Sagadevan, S.   Shahid, M.M.   Yiqiang, Z.   Oh, W.-C.   Soga, T.   Anita Lett, J.   Alshahateet, S.F.   Fatimah, I.   Waqar, A.   Paiman, S.   Johan, M.R.	2021	SDG 7   SDG 9
Thermal, environmental, and cost analysis of effective solar portable vaccine refrigerator by COMSOL Multiphysics	Al-Madhhachi, H.   Al-Najideen, M.	2021	SDG 7   SDG 9   SDG 12   SDG 13
The impact of COVID-19 pandemic on training and mental health of residents: a cross-sectional study	Alshdaifat, E.   Sindiani, A.   Khasawneh, W.   Abu-Azzam, O.   Qarqash, A.   Abushukair, H.   Obeidat, N.	2021	SDG 8
Intellectual capital stocks and flows: examining the mediating roles of social capital and knowledge transfer	Dahiyat, S.E.   Khasawneh, S.M.   Bontis, N.   Al-Dahiyat, M.	2021	SDG 8
Performance habitus: performance management and measurement in UK higher education	Hutaibat, K.   Alhatabat, Z.   von Alberti-Alhtaybat, L.   Al-Htaybat, K.	2021	SDG 8



The relationship between intellectual capital and employees' productivity: evidence from the Gulf Cooperation Council	Buallay, A.   Abuhommous, A.A.   Kukreja, G.	2021	SDG 8
Socially Sustainable Supply Chain Management and Suppliers' Social Performance: The Role of Social Capital	Alghababsheh, M.   Gallear, D.	2021	SDG 8   SDG 9   SDG 12   SDG 16
A sustainable procedural method of software design process improvements	Al-Sarayreh, K.T.   Meridji, K.   Alenezi, M.   Zarour, M.   Al-Majali, M.D.	2021	SDG 9
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An Industry-related Course Development for Mobile Communications Systems in Undergraduate Curriculum of Communications Engineering	Alja'Afreh, S.S.   Alabadleh, A.   Aljaafreh, A.	2021	SDG 9



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