



Annual Sustainability Report



📍 EL-Geish Street, Kafr EL-Sheikh, Egypt

☎ +2-047-3109590

🌐 www.kfs.edu.eg

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What is Sustainable Development

Global Goals of the United Nations shows the wide range of sustainability issues that Kafrelsheikh University lab projects could research - not only looking at environmental issues, but social responsibility too. These 17 goals aim to end poverty, fight inequality, stop climate change, and can be seen as a to-do list for the world – to help people become socially responsible global citizens.



Strategic sustainability framework

The achievements of Kafrelsheikh University in the field of sustainability are not a product of the moment. Kafrelsheikh University planned general objective to integrate environmental, social, and economic sustainability into the culture, structure, and activities of the University. Moreover, to reduce the University's use of natural resources and operating costs, and to instill a mindset of sustainability in the Kafrelsheikh University community by supporting the University's programs in education, research and operations. As the university

is the most distinguished among the Egyptian universities, both in terms of the geographical location and the services provided to population of a special nature, whether in social or economic terms. In 2018, Kafrelsheikh University developed its strategic pillars of sustainability in line with Egypt's Vision 2030 for Sustainable Development and the United Nations Sustainable Development Goals 2030.

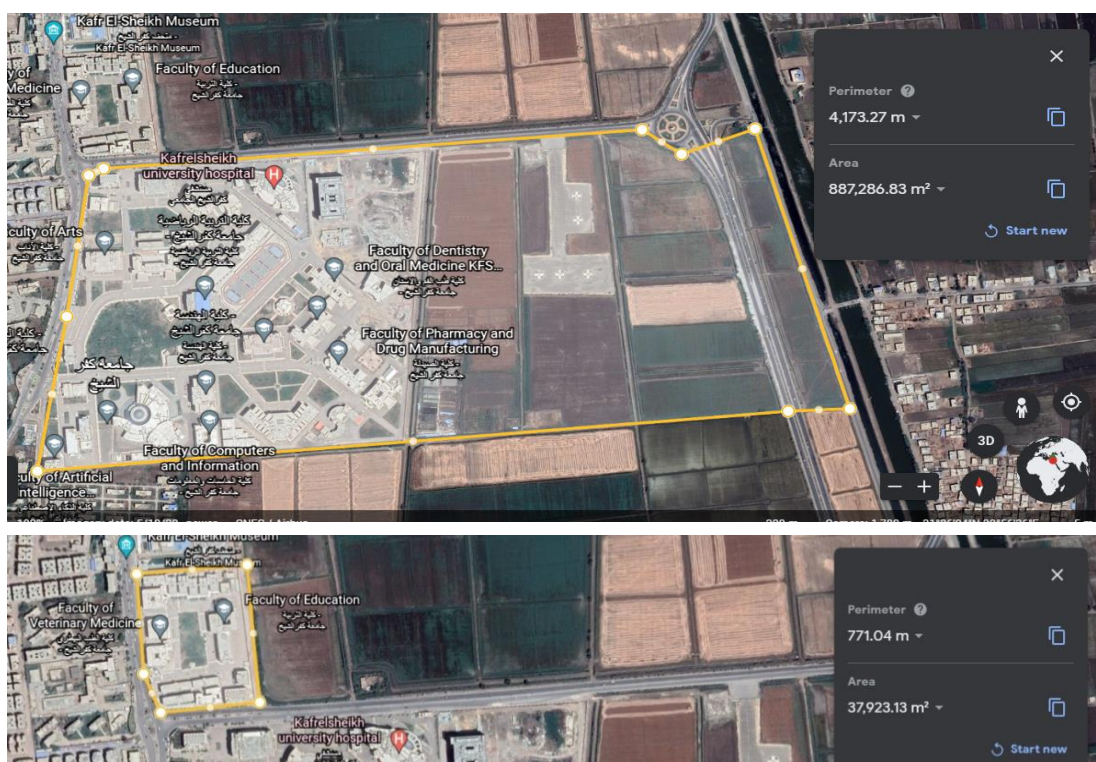
Kafrelsheikh University's strategic sustainability model follows the framework of value creation through the main axes of sustainability: the economic, environmental, social and governance scope. Our approach contributes to discovering and demonstrating the most important sustainability themes and targets; It also highlights our strategic contribution locally and regionally.

This report presents the actual activities of Kafrelsheikh University (KFS) relating to sustainability with four objective 1) Foster Sustainable Resource Management by develop and implement sustainable practices to decrease energy, water, and waste consumption across campus, 2) Improve Carbon Footprint Trends by improve the accuracy of the carbon footprint data and maintain emissions reduction trends, 3) Enhance Social Responsibility by increase the number of sustainability awareness raising events and campaigns on campus each year and 4) Expand Global Recognition by increase participation in international forums and networks for universities committed to environmental sustainability. The KFS sustainable development goals is our central mission. The sustainability ambition and goals is outlined in broad terms in our university strategic Plan. During the academic year, KFS was making relevant progress in many areas of environmental sustainability. special planes were practiced to overcome with pandemic of COVID-19 where many things were changed. The number of Staff and students in our campus was reduces where they had left to work and study from home. nowadays, we soon adjusted to a new tool for working by hybrid work and learning .

[Kafrelsheikh University Setting and Infrastructure](#)

Kafrelsheikh University (KFS) is a governmental university founded with Decree number "129" in 2006. It lies in Kafr El-Sheikh Governorate, which lies

in the northern part of the country along the western branch of the Nile Delta. Kafrelsheikh University is one of the most important educational institutions in Kafr El-Sheikh Governorate. Kafrelsheikh University Campus (KFS) is located in a rural area in Nile Delta zone at Kafr El Sheikh city. Kafr El Sheikh city lies in the northern part of Egypt, along the western branch of the Nile in the Nile Delta. It had a population of 4,172,753, and an area of 3,748 km². The University of Kafrelsheikh has much to offer on our two campuses. The main campus is The University of Kafrelsheikh's largest campus with 887286.83 m² while the other campus is about with 37923.13 m².



The main campus includes Agriculture, Veterinary Medicine, Education, Commerce, Engineering, Specific Education, Arts, Physical Education, Science, Pharmacy, Physical Therapy, Medicine, and Nursing. Dentistry, Aquatic & Fisheries, Computer Science and Information, Alson (Languages), Law; these in addition to scientific Institutes; Institute of Technology and Nano-science: Institute of Drug Discovery and Development; and the Technical Nursing Institute as well. The second campus is focused on the Faculty of Veterinary medicine and Education.

The University included different Faculties with several scientific specialties

such as Credit hours- system is followed in some University' Faculties, in addition to Traditional system of offering educational Programs. However, KSF offering undergraduate Programs (i.e BSc. Degree) and postgraduate study programs (i.e. diploma, master & Doctorate programs). Kafrelsheikh University educates more than 71,000 undergraduates, 11000 graduate and professional students. Our academic programs create dynamic environments that engage students in learning. Our strong commitment to each student ensures that programs are both academically challenging and personally supportive. All the university buildings are connected with the Egyptian network of the universities and well stocked libraries are found in each faculty provided with text books and periodicals which cover several disciplines. All classrooms, labs and lecture halls are fully equipped with scientific equipment's and data show. All buildings are surrounded by green areas and wide roads.

Total area on campus covered with forest vegetation is about 594887 m² of green space (Ratio of open space towards total area: 64.3%) including Blackthorn Manor, Attenborough Arboretum and the Botanical Gardens. This includes almost 5000 trees as well as a host of bird, mammal and plant life.





Areas on campus covered with crops, green houses and trees

During the last year the percentage buildings under construction (construct new buildings for new faculties) and building that operated and maintained is about 40%.



Example of operation and maintenance activities during Covid-19 pandemic

The university is giving special importance to people with special needs, their requests, including allowing them to enter the university with their own car, and allowing them to participate in various student activities. Moreover, in each floor there are accessible toilet for disabled people. Moreover, the university abides by the requirements of the disabled and the blind, and it was taken into account when designing all roads and corridors at the university that they should be designed according to international standards, taking into account the

requirements of people with special needs, and the setting of guiding signs and the establishment of special paths for the blind. special needs and their integration into society, through the provision of many services and benefits offered to them.

A technology center for the blind has also been equipped with computers and the latest programs that facilitate them to deal with the computer to write on various written programs such as Word, either by using the keyboard specially prepared for them, or by voice input using the microphone. The center also provides a printer for prominent letters (in Braille) that makes it easier for students to print their curricula by the means they are accustomed to to review what has been written on the computer, in addition to a machine for copying books and converting them to print in Braille to enable students to convert textbooks to the way they are accustomed to in acquiring their various sciences. The center will bear the entire cost, with the support of the university. The center is not limited in its services to college students, but is open to all university students, and it also provides its services to the blind in Kafr El-Sheikh Governorate. The center offers courses to rehabilitate the visually impaired challenged to deal with computers on their own under the supervision of qualified trainers, provided that these courses are free for all students, whether from the college or outside from the various faculties of the university or from outside the university from the people of Kafr El-Sheikh governorate.



Health infrastructure facilities

Kafrelsheikh University provides health services with comprehensive service support for students, academics and administrative staffs' wellbeing. In each faculty there is a medical clinic for the necessity of first aid for students and staff of the faculty, moreover, in the university campus there is a university hospital, student hospital and outpatient clinics of the faculty of Physiotherapy. The implementation of the second phase of the medical city is currently underway, through the establishment of an emergency hospital with a capacity of 400 beds, an oncology center and a technical nursing institute.



Student Hospital



University hospital



University hospital

Moreover, a unit for the diagnosis and treatment of viruses was established in university hospitals, and equipped with diagnostic and analysis devices for

viruses, especially hepatitis viruses, in order to activate the university's social responsibility. Health and social services for university faculty members were also supported, by providing Sovaldi and complementary medicines for the treatment of hepatitis C virus to faculty members of the university within the framework of the treatment regulation.

Security and safety facilities

The university gives attention to educational sessions to raise awareness and explain the nature of work and how to deal in an emergency situation and how to organize evacuation in times of crisis and how to use a fire extinguisher and then conduct evacuation training



<https://www.youtube.com/watch?v=NhQWvNSfGfI>

(<https://kfs.edu.eg/display.aspx?topic=82397>).

Also, there is a firefighting unit in the university, as well as in each building a central firefighting unit distributed to use on each floor



Conservation of plant and animals

	
	
<p>Green House</p>	<p>Poultry Farm</p>
	
<p>Animal Farm</p>	
<p>Example of Conservation: plant, animal, genetic resources for food and agriculture secured in either medium or long-term conservation facilities</p>	

Energy and Climate Change

Attention has been paid to the university's aesthetic values, including green areas and gardens, and it always works to increase and care for green areas. Therefore, in 2019-2020, Kafrelsheikh University ranked first among Egyptian universities in the classification of green universities that are environmentally friendly.

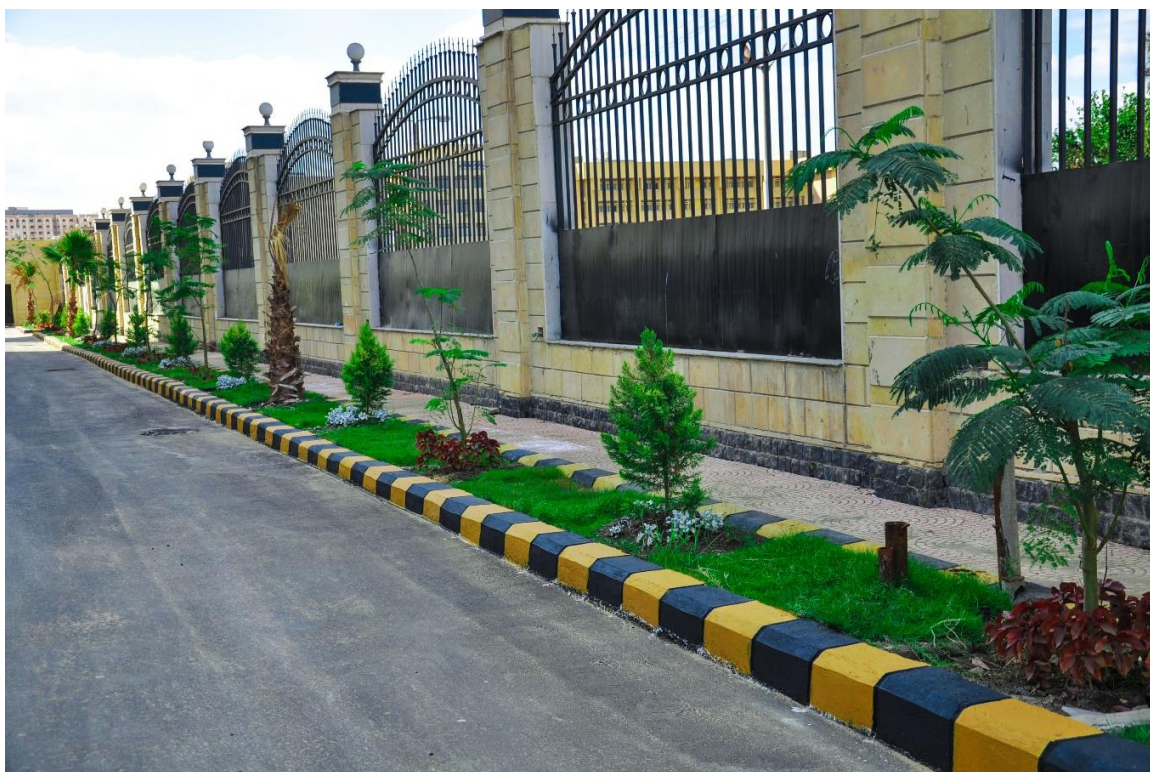












As a result of these successful practices, in 2021, Kafrelsheikh University won the second place in the top Eco-friendly University Competition in Egypt (<https://kfs.edu.eg/engkfs/display.aspx?topic=90926>).

Energy and Climate Change

Carbon Emission

Carbon emissions from Kafrelsheikh university was increased slightly during the last years, driven primarily by continued growth of campus buildings and diesel and natural gas consumption. So, Kafrelsheikh University has developed a carbon management plan to reduce carbon emissions via infrastructure change, transport planning and offsetting. These changes deal with the infrastructure changes made at the university. Extra money has been provided for energy-saving programs and installing renewable energy systems. Behavioral change and effective communication are key features to meeting targets.

Compared to 2019-2020, Kafrelsheikh University (KFS) decreases the total emission of CO₂ by 71% in 2020 - 2021. This year, KFS has seen a reduction in emission intensity, though this was due in large part to the phase out of diesel

power making electricity and natural gas use far cleaner. As a tools to reduce Carbon emissions, the university started using cars and buses that run on natural gas instead of diesel and gasoline. our university has formed a working group of the President's Advisory Committee on Environmental Sustainability to further develop an integrated Climate and Energy Action Plan and giving greater emphasis to be placed on implementing new cost-effective low-carbon technologies.

The university encourages projects that aim to increase the use of clean energy through research projects and graduation projects.



Students of Engineering Faculty invent a double car powered by electricity and solar energy

Renewable energy

At last years, Kafrelsheikh university gave the using renewable energy to generate of the electricity but it till need to significantly increase this progress. nowadays, the university is continuing planning work to develop and increase the using of solar energy the University's electricity demand.



-The amount of renewable energy produced inside the Campus reaches 2 kWh ,Moreover, the university conducted lighting retrofit projects in the farms, labs .physical activities complex, and all grandstands and administrative buildings Where retrofitted old light fixtures with LED or high-efficiency fluorescent bulbs, reducing energy consumption and electricity costs. This change also provides a better quality of light and greater control of lighting systems for major campus events such as convocation. These projects are estimated to save

approximately 40 % per year. The portion of these appliances more than 80% .around the Campus



Sustainable Energy Saving

Current research that helps in saving electrical energy in sustainable manner using the Blockchain technology, published in one of the most prestigious journals in sustainable energy: <https://ieeexplore.ieee.org/document/9528928>

Article

Blockchain-Based Privacy Preserving and Energy Saving Mechanism for Electricity Prosumers

September 2021 · IEEE Transactions on Sustainable Energy PP(99):1-1 · [Follow journal](#)

DOI: [10.1109/TSTE.2021.3109482](https://doi.org/10.1109/TSTE.2021.3109482)

Hany A. Abdelsalam · Anurag Srivastava · Abdelrahman Eldosouky

Hany A. Abdelsalam

Doctor of Philosophy · Professor (Associate)

Institution and department

Kafrelsheikh University · Department of
Electrical Engineering



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Citations

References

Recycling and waste

The KFS publishing Waste Strategy last year by providing information and guidance to support the university's departments, facilities, faculties and

Institutes to minimize and manage their waste. For University's waste, there is a waste contractor, who collect most waste streams from most University buildings (the faculties have separate arrangements for waste, while another exception is departments embedded in University Hospital).

The waste streams you're likely to find in your University building are:

Dry mixed recycling bins accept all types of paper, card, books and magazines, as well as most plastics (containers and bottles - clean and dry only), tins and cans. General waste bins (formerly landfill) take non-recyclables such as wood, plastic wrapping and polystyrene, paper towels and mixed materials items (like crisp packets), as well as food-contaminated items. Food waste bins are available in buildings which produce sufficient volumes of food waste. It's suitable for compostable but, unlike your food bin at home, you shouldn't put paper towels in it.

Toxic Waste Handled:

A) Toxic chemicals were collected from different faculties by central Occupational safety and health committee at Kafrelsheikh University and transferred the toxic chemicals to Alnasariya company, Alexandria, Egypt.

B) Detoxification of the toxic chemicals such as pesticides residues (such as fungicides (metalaxyl, fomaxdone and cymoxonil), herbicides (pendimethalin and atrazine), insecticide (malation) and nemtacides (cabofuran) by compost or different microbial strains.





Example of Toxic Waste Handled (Kafrelsheikh University, Egypt)

Organic waste

One of the most important social roles of Kafrelsheikh University, to take advantage of the waste, is to take advantage of rice straw. Where, large quantities of rice straw are annually produced in Egypt. The goal of this project is to identify economically viable and environmentally sound alternative uses for the approximately 4 Million tons of rice straw in Egypt (120 -130 tons in farm Kafrelsheikh University) that are produced each year and thereby reduce the environmental impact of field burning causing black cloud, which is the current disposal method.



The project will be carried out by a project team that has expert knowledge on rice straw utilization and conversion to beneficial forms such as compost or as animal feed. A) Composting is a biological process in which organic biodegradable wastes or stabilized and converted by the action of some microorganisms under controlled conditions (aeration, moisture, temperature, etc), into a hygienic, humus-rich product (compost) to be used as a soil conditioner and an organic fertilizer. B) As as animal feed, agricultural crop residues, especially cereal straw, contribute to a major part of the diet of ruminants in developing countries. Crop residues are lignocellulose materials rich in energy, low in crude protein, and poor in palatability. Various chemical and physical delignification methods to improve the digestibility of straw have been extensively researched. Biological methods of treating straw of using microorganisms such as white-rot fungi have also been reported.

*as described in (3.3 /3.4)

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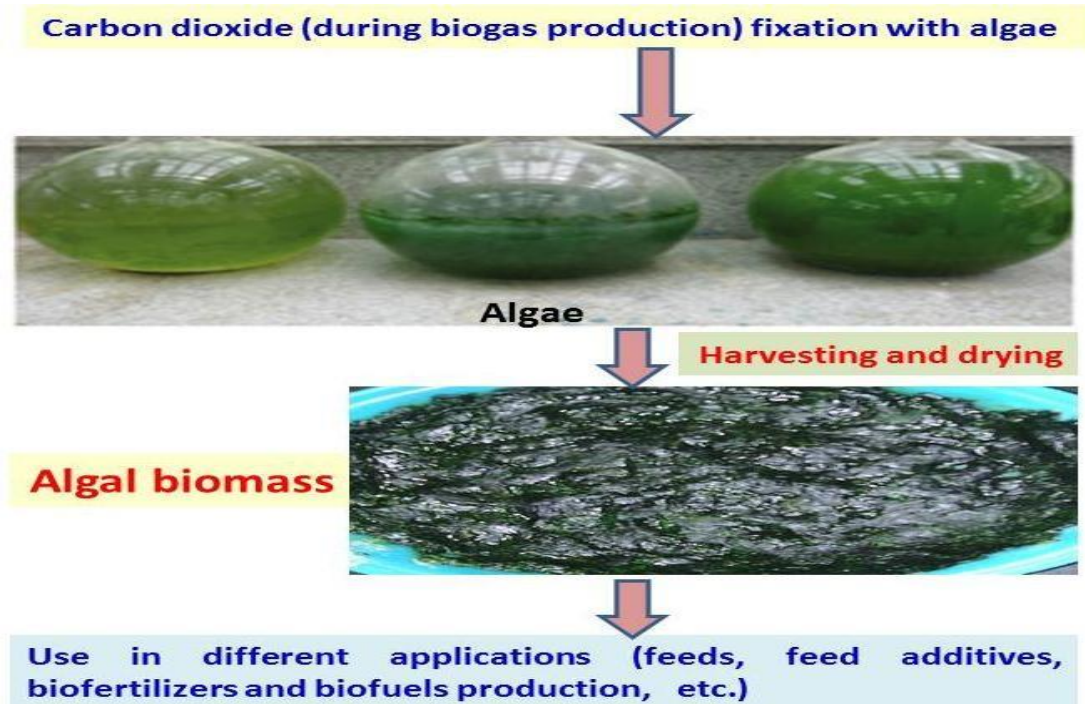
Example of Organic Waste Treatment (Kafrelsheikh University, Egypt)

Sewerage Disposal

Description:

Biogas is produced by anaerobic degradation of organic substrates such as sewage sludge, municipal solid wastes and animal manure. Biogas is an important source of energy in heat and electricity generation, it is one of the most promising renewable energy sources in the world. During anaerobic degradation, microorganisms degrade the organic matter contained in the sludge and convert it into biogas, a mixture of mainly methane and carbon dioxide. Carbon dioxide was fixed by algae to produce algal biomass which is used in different applications (feeds, feed additives, bio fertilizers and biofuel production, etc.).





Example of Sewerage Disposal (Kafrelsheikh University, Egypt)



Project titled "Algal biomass Production for use it as non-conventional fish feed; remediation of chemicals contaminated water; CO₂ capture; biodiesel and omega-3 production"

Water

Water Conservation Program Implementation



All buildings on campus have a separated sewerage system, for waste water and for clean water (rainwater). Rain water is thus collected from the roofs, parking area etc. of the buildings and is then discharged into the local ponds and canals around the buildings. Also, some of the rainwater is collected for watering the plants inside the campus.

Water Recycling Program Implementation

Closed to Kafrelsheikh university, about a 1 kilometer away, there is Wastewater Treatment Plant of Sakha, and this station is considered the largest one in the Delta zone in terms of absorptive capacity.

- The use of treated water in fish reclamation.
- This is the first station in Egypt that produces biogas from sewage sludge.



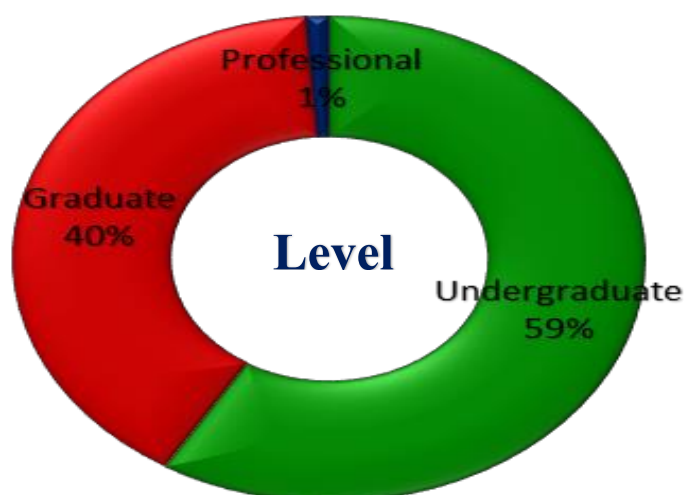
Transportation

No.	Vehicle	Total Number
1	Car managed by the university	100
2	Cars entering the university	400
3	Motorcycles entering the university	100
	Total	600

Education and Research

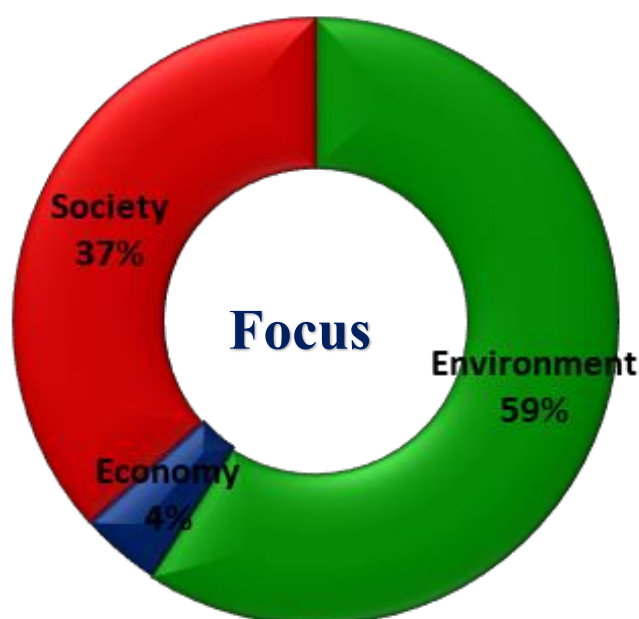
Total Number of Courses/Subjects Offered

The most effective tool to instill change is education. The University's commitment to sustainability extends greatly into its educational mission. Across the University, students are given opportunities to learn about sustainability concepts and find solutions to complex environmental issues. KFS offers a variety of courses across faculties and departments that investigate sustainability through different lenses. From undergraduate to professional programs, sustainability is incorporated into all levels of education at KFS.



Number of Courses/Subjects Related to Sustainability offered

Kafrelsheikh University, as an educational institution, has an important role to play in advancing knowledge for a sustainable future, and has a strong history of education and research related to sustainability. At Delta zone, KFS offered great efforts to achieve its goal of being a leader in environmental sustainability education and research at her zone. Environmental management primarily focuses on minimizing the negative environmental impact through technological, innovative and behavioral solutions.

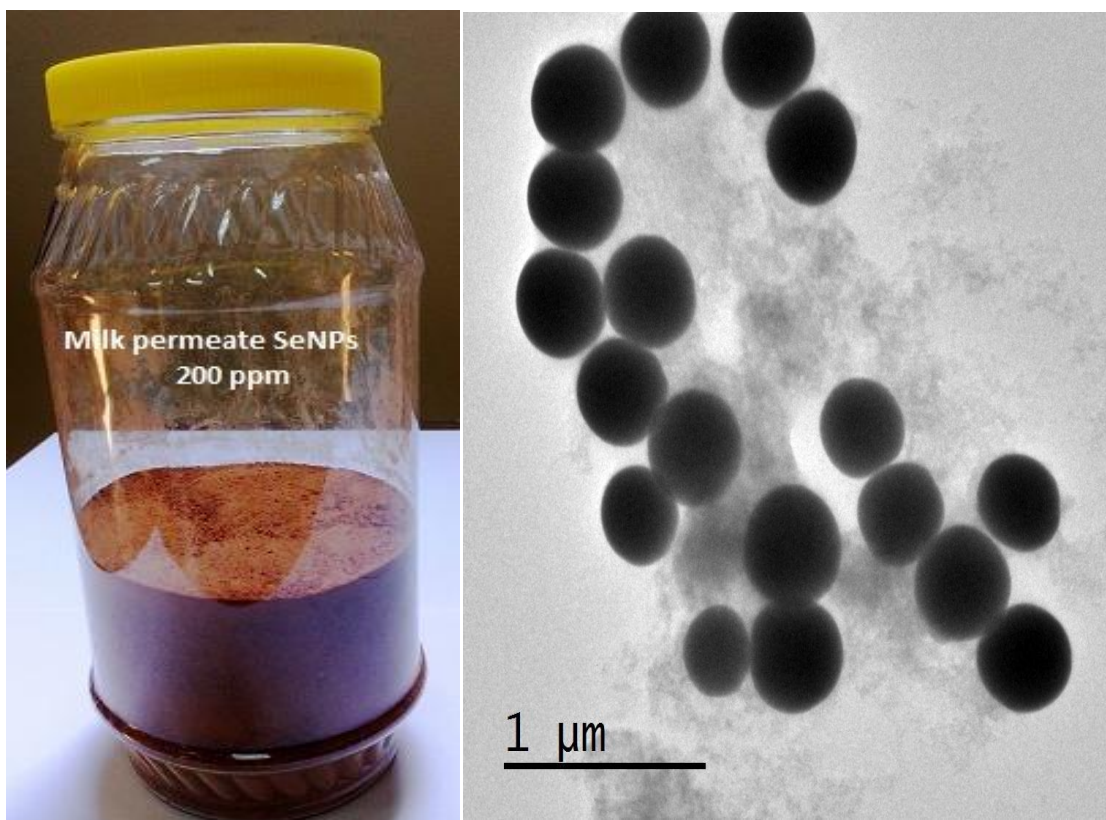


During this year, KFS offered 10027 courses focused on or related to sustainability. In some programs, the percentage of courses related to sustainability reaches 90% like the program of Protected Agriculture Technology which will be carried out at Faculty of Agriculture, from this year.



Project entitled: Production of algae biomass for use in different fields.

<https://kfs.edu.eg/agre/displaytopic.aspx?topic=87837>



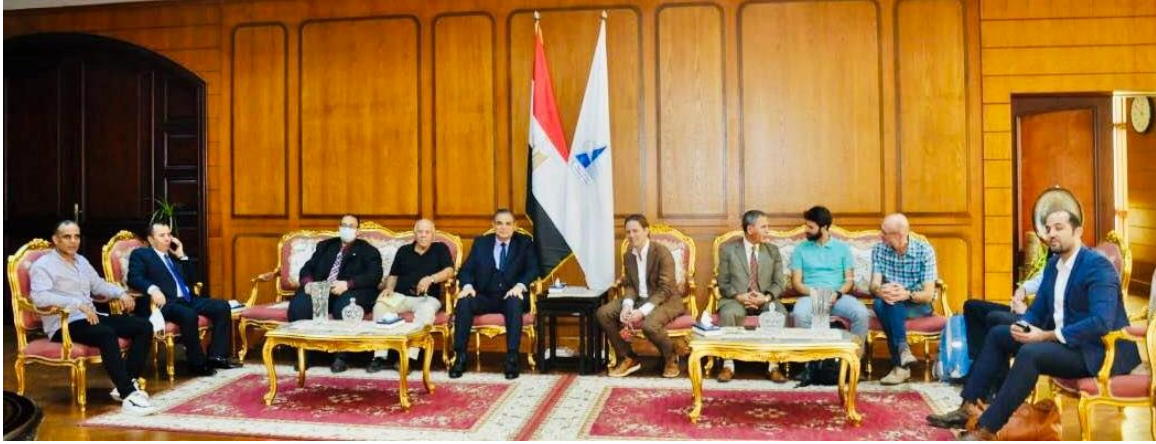
Project entitled: Biological production of Nano-selenium spheres and its application in livestock production

Signing a number of agreements with foreign universities and organization related to the issue of sustainability

The number of agreements concluded between Kafrelsheikh University and Arab and foreign universities reached (80) memorandums of understanding, including (12) memoranda of understanding that were made during the

academic year 2020/2021.

A Dutch delegation from Wageningen University discusses common interests with Kafrelsheikh University in the field of climate change and sustainable agriculture





KFS received the Ambassador of Belarus to discuss academic and research cooperation

<https://kfs.edu.eg/engkfs/display.aspx?topic=86441>



KFS received the ambassador of Mauritania to discuss cooperation in education and scientific research

<https://kfs.edu.eg/engkfs/display.aspx?topic=87011>



Kuwaiti Cultural Counselor in Cairo

<https://kfs.edu.eg/engkfs/display.aspx?topic=87419>

Moreover, the university encourages students to exercise as one of the most important sustainability practices through

1. Sports facilities at the Faculty of Physical Education





2. Practicing sports in the open spaces provided by the university inside the university campus



Number of cultural activities on campus

Student activities at the university is one of the basic activities that the university is keen on in order to diversify the interests of students, strengthen their skills and enhance their spirit of initiative, based on the university administration's belief in the importance of the experiences that students gain from practicing their activities outside the classroom.

The university has Arts Center, which aims to develop students' skills in the fields of plastic arts, theatre, music and choral. It offers art workshops for students to spread the spirit of teamwork and build the creative spirit.

An annual competition is held between students of different faculties, whether in theatrical acting, Cultural Activities and Information League, sports activities social activities and Scouting and public service activities



(https://kfs.edu.eg/student_affair/display.aspx?topic=6640,

https://kfs.edu.eg/student_affair/display.aspx?topic=6534,

https://kfs.edu.eg/student_affair/display.aspx?topic=6551)



https://kfs.edu.eg/student_affair/displaytopic.aspx?topic=91028

<https://gate.ahram.org.eg/News/2925547.aspx>

During 2020-2021, Arts Center of Kafrelsheikh University achieved the first place between Egyptian universities in the field of theater and expressive arts, and the university also obtained the fifth place in the field of choir at the university level in the competitions of the closing festival of arts centers in universities, which is organized by the Ministry of Youth and Sports

During the month of October 2021, Kafrelsheikh University held the first national sports festival for student families with the slogan "Youth of the Universities of the New Republic"



https://kfs.edu.eg/student_affair/displaytopic.aspx?topic=91086

https://kfs.edu.eg/student_affair/displaytopic.aspx?topic=91084

Number of university program(s) to cope with Covid-19 pandemic

During the past year 2020-2021, the university has set some organizational rules that will reduce attendance at the university except for the utmost necessity, which are as follows:

- Applying a hybrid learning and working strategy
- Organizing most of the online training courses
- Reducing the number of employees inside the university and the number of students, especially students of theoretical faculties



University plan to confront Covid-19 for 2022

The university has set a set of rules for organizing work during the academic year 2021-2022, which are as follows:

- Having at least the first dose of vaccination of Covid-19 for all university employees and students before the start of the new academic year 2021/2022, to protect them from the fourth wave of Covid-19, as part of the university's precautionary plan to prevent the spread of the virus and put the health and safety of its employees at the forefront of its priorities.
- Providing corona vaccine for free to all students and university employees before the beginning of the academic year.

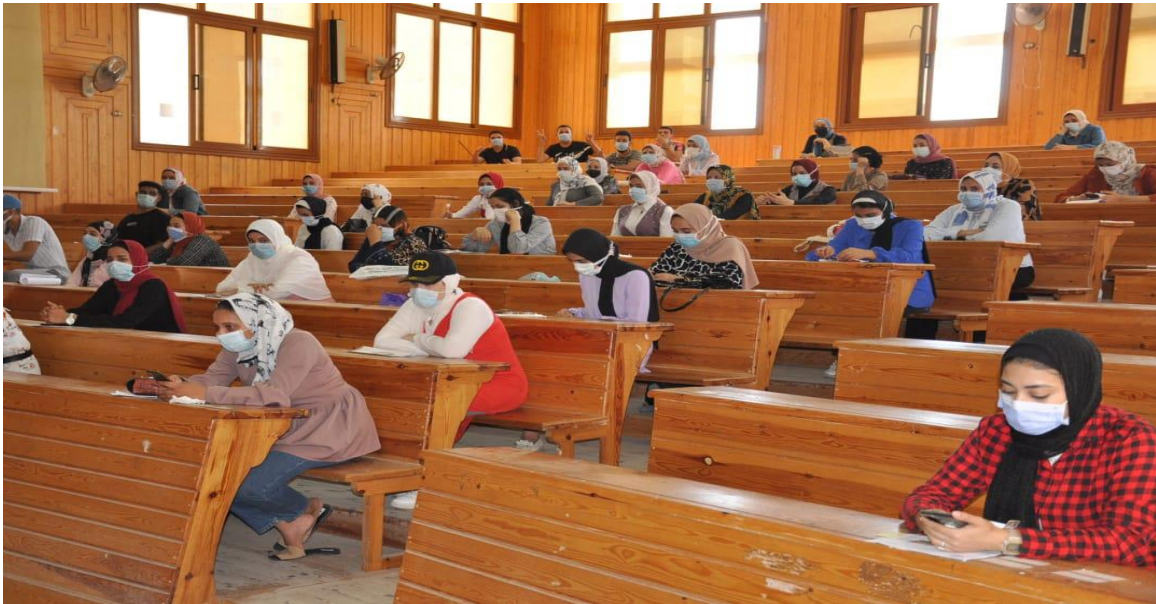
<https://kfs.edu.eg/engkfs/display.aspx?topic=90641>



- Periodic disinfection and sterilization operations within the framework of precautionary measures to limit the spread of the Corona virus epidemic, whether on university campuses or university cities.
- Using thermal detectors on the university doors to measure students' temperatures before entering the university.



- Adhering to the guidelines set by the university within the preventive measures such as limiting the social interaction and wearing a mask.



- To limit the number of persons in KFS campus by applying the hybrid learning.
- The most important instructions and decisions for students are published through giant screens spread across the university campus



Community

The Community arm of Social Impact promote opportunities for staff, students, organizations and the public to engage with our work, learn more about the Sustainable Development Goals and access volunteering and research opportunities. We will continue to make a difference to society through our research, our teaching, our outreach programme, our contribution to the environment, and by encouraging our students and graduates to make a positive impact

Medical Convoys

During 2020-2021, the total number of patients benefiting of convoys is 11862 persons



Integrated Medical Convoy to the Villages of Motobas.

<https://kfs.edu.eg/engkfs/display.aspx?topic=90720>

Veterinary convoys

Convoys from the Faculty of Veterinary Medicine to the villages of Kafr El-Sheikh Governorate



Agricultural convoys to the different villages of the Delta



Training courses for community members on advanced irrigation systems technology with climate change



Guidance convoy entitled: Agricultural operations to improve the soil and increase the productivity of field and vegetable crops [.https://kfs.edu.eg/agre/photo/7320211015117.jpg](https://kfs.edu.eg/agre/photo/7320211015117.jpg)



Contents lists available at [ScienceDirect](#)

Computers & Industrial Engineering

journal homepage: www.elsevier.com/locate/caie

ELSEVIER

Evolutionary algorithm-based convolutional neural network for predicting heart diseases

Ali A. Samir^a, Abdullah R. Rashwan^a, Karam M. Sallam^{b,c,*}, Ripon K. Chakraborty^d, Michael J. Ryan^d, Amr A. Abohany^a

^a Faculty of Computers & Information, Kafrelsheikh University, Egypt
^b Faculty of Computers and Informatics, Zagazig University, Egypt
^c Faculty of Science and Technology, School of IT and Systems, University of Canberra, ACT 2601, Australia
^d Capability Systems Centre, School of Eng. & IT, UNSW Canberra at ADFA, Australia

Check for updates

ARTICLE INFO

ABSTRACT

The role of the mosque and the church in building the Egyptian personality

Innovations for society

- **An intelligent system through the mobile for diagnosing heart diseases** based on deep learning. Research from the project was published in one of the 14 best journals in the world in the field of artificial intelligence.
- **Smart Spoken Gloves:** the project aims to help the deaf and dumb people with disabilities by employing Internet technology to translate sign language.



It is a glove that a deaf person uses to convert his hand signals into sound through an application that is installed on the mobile, and the other person can also respond to it through this application.

Smart Blind Stick Assistant:

The smart stick contains four basic components:

1. **A sensor for obstacle detection**
2. **Traffic light detection**
3. **Emergency button**
4. **Location Tracking**

5- **Be My Eye smart application** could help to identify the different banknotes and speaks them to the blind to enable them to avoid financial fraud.

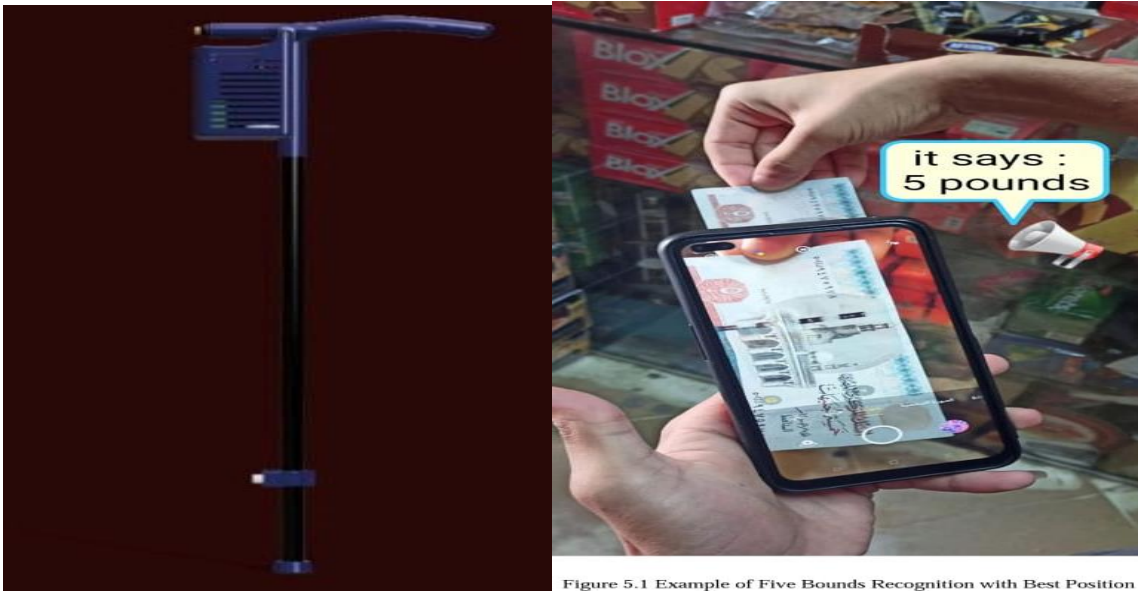
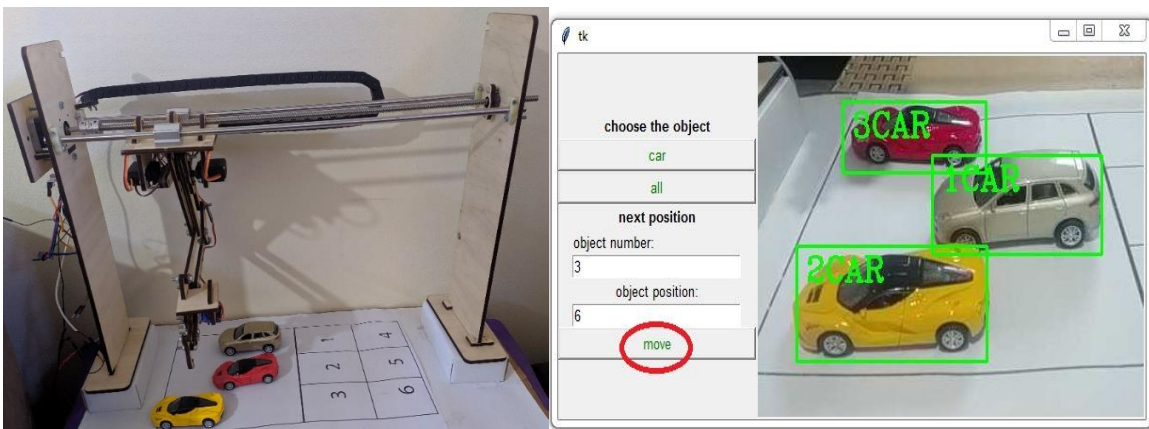


Figure 5.1 Example of Five Bounds Recognition with Best Position

Classifier Robot Arm: Applying our robot arm classification tool provides high safety working environment and reduction of operating cost by enable the workers to do this work remotely.



Adult Education and Literacy

Kafrelsheikh University is holding meetings with the officials of the Adult Education Authority branch in Kafr El-Sheikh to eradicate illiteracy in Kafr El-Sheikh Governorate to have "Egypt Free of Illiteracy", and university students participate in the eradication of illiteracy. The number of beneficiaries, during 2020 – 2021, is 5075 persons



Overcoming Drug Addiction

