



Al Balqa Applied University

Sustainability Report 2023



BAU-Green

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Preface

The Al-Balqa Governorate is situated to the west of Amman, the capital of Jordan. It has served as a significant crossing point throughout various historical periods due to its proximity to the surrounding cities. One of the most vibrant aspects of Al-Balqa' Governorate is Salt City, nestled at an impressive altitude of 1,100 meters above sea level and encompassing the Dead Sea - the Earth's lowest point - within its boundaries. The old structures and monuments stand as testament to its original purpose and heritage.

Al-Balqa' Governorate is a province of intellectual heritage and folklore, and it is popular for recreational and religious tourism; traveler may visit many ruins and sacred shrines for Prophet Shu'ayb (Maqam Nabi Shu'ayb), Prophet Joshua Ben-nun, Prophet Gad Ben Jacob, Prophet Ayub, Prophet Hazir, and Prophet Gilad (May Peace Be Upon Them), as well as the shrines of two of Prophet Mohammad (Peace Be Upon Him) Companions: Abu Obeida Al-Jarah and Dirar Ibn Azwar.

Since the establishment of the Emirate of Jordan in 1921, Al-Balqa' Governorate, along with other cities in the Kingdom, has played a crucial role in the nation's development. Salt City gained prominence for its contributions to science and education. The inauguration of Salt School in 1923 by His Majesty King Abdullah the First (then Prince) marked a significant milestone, as its graduates went on to become esteemed officials and leaders of the nation.

Upon firmly acknowledging the educational and scientific long history of Salt City along with its leading role in the field of education by the Hashemite leadership, Late King Hussein Bin Talal – May God rest his soul – honored Balqa' governorate by the issuance of the royal decree to establish Al Balqa Applied University (BAU) in Salt city on the 22nd of August 1996. This has enhanced the city's role, commemorated the pioneers of its early graduates and scientifically empowered its legacy which we hope to continually flourish, since then, Al Balqa Applied University has become the largest public university in Jordan with an area of 11170659 m². Its buildings are designed through stages to have

both ancient and modern buildings having its center campus on one of Salt City Mountains.

To enhance the experience for visitors, students, and staff, the university maintains lush green spaces, comfortable benches, and convenient walkways. From its inception, the university has aimed to forge a meaningful partnership with the local community, enabling them to invest in and establish facilities and services such as restaurants, shops, and bookstores near the university campus. This collaborative effort aims to enrich the academic lives of students and foster a cohesive society.

Al Balqa Applied University (BAU) has strategically positioned itself to meet the dynamic demands of the labor market at local, regional, and international levels. With a network of 15 campuses distributed across Jordan, BAU is well-equipped to adapt and respond to evolving industry needs, by emphasizing knowledge acquisition, active engagement, collaborative efforts, and innovative practices, BAU is on a trajectory to become a university where sustainability is deeply ingrained in every facet of its operations. This includes fostering a comprehensive understanding of sustainability principles among both staff and students. Such an approach aims to effect positive, enduring change with far-reaching benefits, Our Sustainability Strategy, delineated through the year 2025, provides a roadmap for our commitments in this regard. We recognize that achieving a sustainable future requires a fundamental shift in behavior and a united front of cooperation.

At BAU, we acknowledge that sustainability transcends mere environmental impact reduction. It encompasses resilience and intelligence, forging connections between students, research endeavors, and operational activities. This integrated approach empowers us to make meaningful contributions towards positive change.

In 2018, we took a decisive step by pledging our support to the SDG Accord, a global initiative uniting the higher education sector in response to the United Nations' Sustainable Development Goals (SDGs). This initiative is pivotal in embedding these

goals into post-secondary education, recognizing and advancing the pivotal role education plays in achieving these objectives. The SDGs collectively strive for a more inclusive, sustainable future, tackling critical global challenges including poverty, inequality, climate change, environmental degradation, prosperity, peace, and justice.

In accordance with the Sustainable Development Goals (SDGs), also known as the Global Goals, that were adopted by all nations as a universal call to protect the planet and ensure that all people enjoy peace and prosperity by 2030, various entities including governments, businesses, media, higher education institutions, and local NGOs bear a shared responsibility for their achievement. Al-Balqa Applied University (BAU) is proud to be a member of the United Nations Academic Impact (UNAI) and participates in the United Nations Sustainable Development Solution Network (UNSDSN).



Sharing a culture of intellectual social responsibility



Sharing a Culture of Intellectual Social Responsibility

The United Nations
welcomes
Al-Balqa Applied University, Jordan

as a member of the United Nations Academic Impact
and values its commitment to the following ten principles:

- > Commitment to the United Nations Charter
- > Human Rights
- > Educational opportunity for all
- > Higher Education opportunity for every interested individual
- > Capacity-building in higher education systems
- > Global citizenship
- > Peace and conflict resolution
- > Addressing poverty
- > Sustainability
- > The "unlearning" of intolerance

Ramu Damodaran
Ramu Damodaran

Chief, United Nations Academic Impact
Department of Public Information
United Nations

29 January 2019

Sharing a culture of intellectual social responsibility with United Nation Academic Impact

| Organization | Country | Networks | Additional Networks | Type |
|---|------------|-------------------|---------------------|---------------|
| 759 United Nations University | Japan | Japan | | National SDSN |
| 760 Keio University | Japan | Japan | | Member |
| COUNTRY | | | | |
| ▼ Jordan Count 4 | | | | |
| 761 West Asia-North African Institute | Jordan | Global | | Member |
| 762 AMMAN ARAB UNIVERSITY | Jordan | Global | | Member |
| 763 Al-Balqa Applied University | Jordan | Global | | Member |
| 764 Jordan University of Science and Technology | Jordan | Global | | Member |
| COUNTRY | | | | |
| ▼ Kazakhstan Count 20 | | | | |
| 765 Astana Civil Service Hub | Kazakhstan | Kazakhstan Global | | Member |
| 766 Akhmet Yassawi University | Kazakhstan | Kazakhstan Global | | Member |
| 1,746 records | | | | |

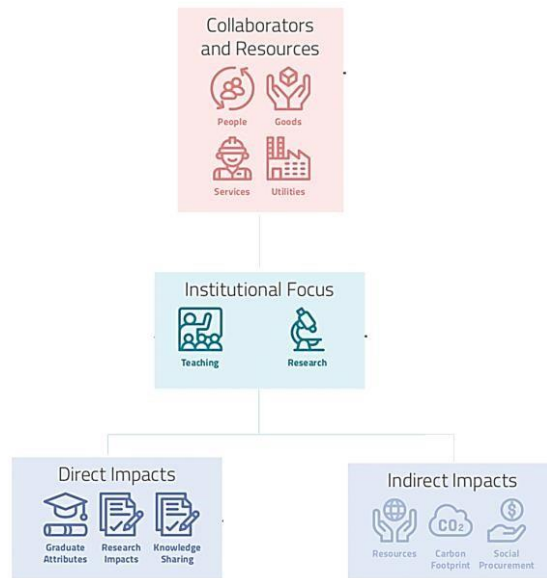


SDSN Members are the backbone of the SDSN and are invaluable resources for the National and Regional Networks and Secretariat. These institutions are fully independent with their own governance and leadership, completely separate from the SDSN's.

BAU's membership in UNSDSN (United Nation - Sustainable Development Solution Network)

How we create value

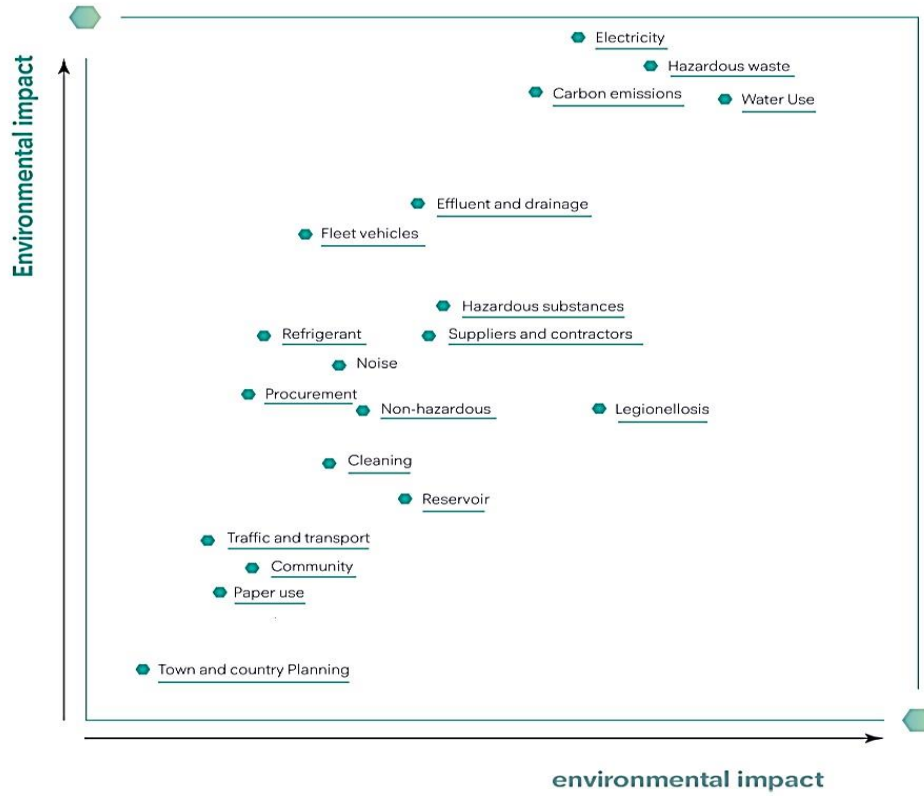
While the University is a large and complex organization, its key collaborators and resources, institutional focus direct and indirect impacts can be summarized by the following value chain diagram. With the size and complexity of the organization in mind, this value chain focuses on the material topics identified by stakeholders for this report.



BAU Model of Creating value of Sustainability

Our sustainability stories, Significance of Environmental Aspect

Evaluation Environmental Aspects –impacts collect from our system in BAU operation system and this where classified Probability Severity Likely, Unlikely Highly, Unlikely Serious, Intolerable and study the impact to the environment.



Evaluation Environmental Aspects –impacts

1- Settings and Infrastructure

BAU offers the programs through 15 campuses spread over Jordan, with total area (11170659) m². The Campus sites are designed through stages, and it contains ancient and modern buildings. The main Campus is located on a mountain at Al Salt City which is shown in the Google earth image. The total campus ground floor area of buildings (152,282) m² which means that the ratio of open space area to total area 98.6%, which is one of our advantage comparing with urban university campuses. Most of the campus sites characterized by wide range of vegetation cover such as rangeland and forest. The University's headquarters is in the city of Salt, Al Balqa governorate where the climate is Semiarid / Suburban.



. The main Campus located on a mountain at Al Salt City

Maintenance Activities

BAU is taking a keen interest in implementing its strategies for managing resources and strategies for managing educational facilities infrastructure in order to ensure the readiness to be safe, healthy university environment and a sustainable workplace, providing services accordance with best practices.

BAU has own policy on maintenance activities states "ensuring the sustainability of a safe and a healthy university environment; By ensuring the readiness of the university's facilities and infrastructure, and the maintenance of equipment, materials and teaching aids, to provide academic and administrative services efficiently, to achieve the university's mission and strategic objectives", BAU also, has a policy "University's' environmental preparedness' which states on "ensuring the sustainability and readiness of a safe and a healthy university environment; by: applying global health and international environmental standards, using clean energy, rationalizing water consumption, expanding green spaces and parks, reducing carbon dioxide emissions and other forms of pollution, and managing waste properly, to provide services efficiently to achieve BAU's vision educationally, socially, and environmentally".



Operation and Maintenance activities

The university implements its policies through several comprehensive maintenance procedures, which include (preventive periodic maintenance and corrective maintenance program) for buildings, classrooms, labs and workshops, sports facilities, auditoriums, and theaters in all sites. Moreover, a number of maintenance activities have been done this year, such as renovated some fences and strengthening them in a way that enhances the requirements of a safe environment and painting many buildings by using acrylic paint water resistant, insulation some roof, maintenance to the classrooms and equipped it with appropriate seats, equipment and data show tools. As well as the university-maintained alarm systems and Fire Suppression Systems, paving of corridors and maintained student dormitories, additionally to renovation, rehabilitation, and restoration buildings, grounds, warehouse/storage facilities, gardens, toilets, and halls, in addition of carrying out preventive maintenance before the winter season. which includes cleaning rainwater channels, water collection tanks, and others, and working periodically to clean drinking water tanks to keep them clean, and to maintain toilets to ensure that water is not wasted.

Green Area

BAU adopts a sustainable continuous improvement policy and seeking to achieve large vegetative area, so it is working within a well-organized strategic and action plans through a lot of initiatives, projects, and programs to increase the green areas throughout campus sites, such as convert (11600) m² parking areas to gardens and increase planted vegetation area from (1,137,194) m² to be (1,148,854) m², with an active contribution from the BAU's population to propagate plants at the BAU's nursery (plantation) and plant it in BAU gardens. Al Balqa Applied University spreads throughout the Hashemite Kingdom of Jordan where the trees are 100-300 years old with a total area of forest vegetation (463840 m²) for example in center part of Jordan we have Princess Rahma College with (94724 m²) covered with *Pinus halepensis*, while in northern part of the Kingdom we have Ajloun College with forest area (97591m²) with *Quercus spp* and east part we have Al Humra with (97708m²).

Recently, the Faculty of Agricultural Technology has been very active in the domain of increasing the area of campus covered with forests and planted vegetation with area (17840 m²). It has had several projects and initiatives, the most prominent is the cultivation of Moringa trees, Al Sidr trees and *Quercus Ithaburensis* trees, as these trees do not consume a lot of water (drought resistant plants), rehabilitating olive trees and palms farms and established an orchard for tropical fruits.



Example of forest vegetation Areas and activities



Open Space Area

A water absorption area besides forest and planted vegetation, such as: soil, grass, etc, as shown above with 9,119,529 m² total area and forming 81.6% of the total area, This water absorption area of frequent moisture uptake has played an important source for plant and vegetation.



Water Absorption area in one of campus sites (Princes Rahma campus)

Smart Building Implementation

Real-time monitoring can be one of our most important issues for reducing energy costs by detecting equipment faults and inefficiencies early. Sensors mounted on critical operating equipment such as motors, pumps, and fans can measure variables such as vibration, power consumption, temperature, humidity, and others. We can better predict when equipment is likely to fail and fix it before it fails by identifying anomalies in those measurements. Furthermore, when combined with real-time energy monitoring and advanced analytics, demand response becomes much more effective. Knowledge of energy consumption and environmental information enables the system to run power-hungry components during off-peak power periods. In the future, we intend to equip lights with sensors that can detect occupancy, level of activity, temperature, humidity, and other factors and send this information to the cloud. In the short term, this is beneficial because the lights turn off automatically when no one is in the room, saving money. Nowadays, more than half of university buildings are classified as smart buildings.





Sample of smart building implementation

Security and Safety Facilities

The University is dedicated to fostering a safe culture among faculty, staff, students, and visitors, as well as to providing a safe and healthy environment to work, study, live, or visit. The University is committed to following all applicable workplace safety, health, and environmental rules and regulations, as well as respecting and caring for the environment without compromising future generations' ability to meet their needs.

With a large population of students, staff, and visitors, combined with widespread campuses, BAU's sites are providing a unique set of security measures and safety facilities to ensure safety and security measures are robust such as fire Suppression Systems.



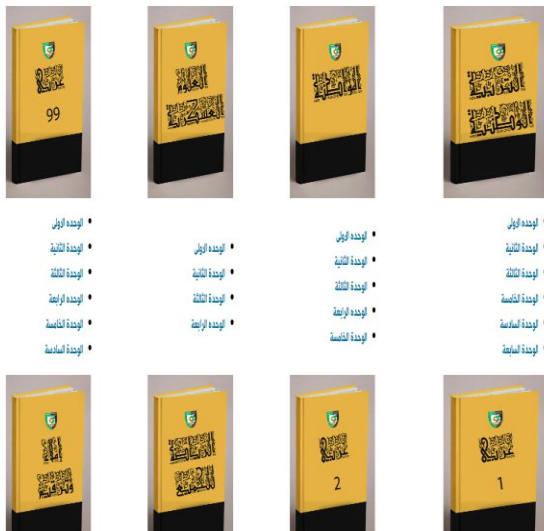
Security and safety facilities

Facilities for disabled, special needs and maternity care.

The university is keen to ensure a sustainable safety and healthy environment by creating a stimulating environment for students and workers that allows everyone to develop and excel, by implementing public safety and security policy, and by applying the best security and safety practices to preserve the safety of property and individuals in order to enable staff to perform their tasks and responsibilities efficiently and competently, as well as to contribute to the achievement of the university's strategic objectives.



مصادر تعليمية



Energy and Climate Change

Al-Balqa Applied University (BAU) is one of the largest state universities in the Hashemite Kingdom of Jordan. It provides services through its distributed campuses across the country, covering nearly all climatic regions from the highlands in the mid-west to the very dry governorates in the south and far east of Jordan. This diversity in climatic conditions, motivated (BAU) to adopt wide range of activities related to climate

variability and change, with the focus on climate adaptation. For example, (BAU) is innovative university in terms of water and draught research, capacity development, and pioneer technology transfer initiatives ranging from solar energy to wastewater treatment for reuse, to smart agriculture. Moreover, (BAU) established academic technical programs with the focus on smart agriculture, water treatment, smart buildings, electric and hybrid vehicles, not to mention the various awareness activities in climate change. Another clear example of the serious role Al-Balqa applied University play in the region is demonstrated by hosting the 76th United Nations Days in 2021 with the focus on climate change. Despite the well-established practices of (BAU) in conserving resources and protecting the environment, this climate action plan is the first written plan. The purpose of this plan is to document the existing successful practices, and to build on it is considering the Jordanian National Climate Change Policy.



Solar panels at BAU

The objective of this project has been to implement small-scale solar systems in different university buildings, including innovative solutions, such as substitute sheets of photovoltaic glass or photovoltaic coverage of building roofs. The photovoltaic

installations have been carried out in the faculties of science and Administrative Building, using a crystalline silicon photovoltaic glass with dimensions of 1,500 x 1,100 mm and medium transparency. In the faculty of science, glass has been installed in a photovoltaic canopy consisting of 126 units with a total area of 208 m² and a power of 26,6 kWp. This canopy is located on top of a conventional glass skylight providing even more thermal insulation to the building. The total electricity production of the system is 1,471,400 kWh, this energy being able to reduce the emission of 94,5 tons of CO₂ in 35 years. The second installation of photovoltaic glass with an area of 191, 4 m² has been carried out in a brise-soleil on the facade of the Administrative Building. The 116 glass units of this installation have a total power of 24, 48 kWp, and enough power to produce 1,354,115 kWh in 35 years. It's important to note that BAU is actively transitioning towards a fully renewable and sustainable energy model. To this end, BAU has successfully completed the construction of a new solar park project with a capacity of **7MW**, seamlessly integrated into the national grid.



New Solar Park with



Solar tracking systems



Use of LED lighting and natural ventilation and skylight of buildings

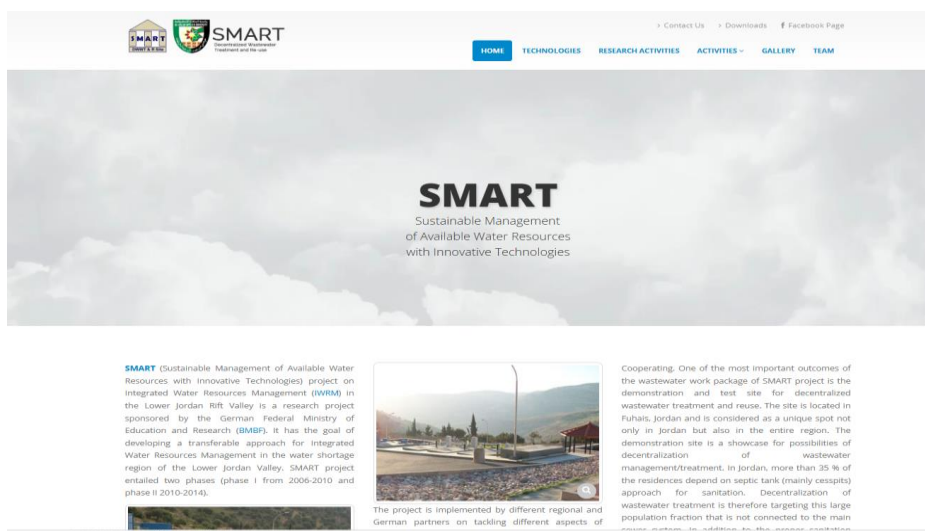
2- Water

BAU is seeking to achieve 6th UN SDG (Clean Water and Sanitation), by its policy which aims to:

1. Using water harvesting techniques to collect rainwater from building roofs in tanks for reuse in agriculture.
2. Using various technologies to reduce water consumption in various locations (toilets).
3. Improve sewage treatment plants to use treated water for irrigation purposes.
4. Raising awareness of rationalizing water consumption at the University.

In 2009 the German Ministry of Education and Research agreed with the Jordanian Ministry of Water and Irrigation to fund the creation of a demonstration site for different wastewater treatment systems at Al-Balqa Applied University. “We are looking to solve the water problem in Jordan,” says the university’s president, Abdallah Al-Zoubi. We are looking not just to have more water treatment plants; we are planning to teach the people how to treat their own water”. So, BAU tries to search and put in works international partnerships and collaboration one of the them fruits to collaboration with Helmholtz Environmental Center (UFZ) from Germany, and in coordination with (Ministry of Water

and Irrigation) MWI, (Sustainable Management of Available Water Resources with Innovative Technologies) SMART-Move [Picture: 1&2] provides fund to BAU to sustain, operate, maintain, and monitor the facility and other technologies SMART-Move is one of the pioneer and unique development projects in Jordan, and in the Middle East. It provides principles and applications of decentralized wastewater management in way that simulates the European approach considering conditions such as wastewater characteristics and climatic variability in Jordan and in the Arab Region. Further, this project focuses on decentralized wastewater treatment and reuse as a management strategy to alleviate demand on conventional water resources. The project provides demonstration, operation and maintenance of decentralized wastewater treatment technologies and it builds on and completes the efforts exerted earlier in the previous SMART 1 and SMART 2 projects by the design and operation of a competence facility for demonstration, decentralized wastewater management in Fuhais Figure 14, within the premises of Fuhais wastewater treatment plant and in coordination with the Jordanian Ministry of Water and Irrigation (MWI). This facility provides services in demonstration, research, and training these services cannot be found in one spot but in this facility and it helps researchers and institutions from Jordan and from the Arab Region as well.



SMART (Sustainable Management of Available Water Resources with Innovative Technologies)

Furthermore, in order to meet the demand in the local and regional markets, BAU offers a new two- to three-year diploma program in wastewater treatment at Al Salt Technical Faculty.



The “WATRA PROJECT” a series of training workshops and study tours where organized by BAU, IHE Delft, and funded by the World Water Academy (WWA) in the Netherlands

BAU treated its sewage using down cycling technology in which the waste is divided into its main components. Semi-solid waste (sludge) the by-product of the treatment process is disposed off. The University has a purification plant and disposes of wastewater through the sewage network. The gray water coming out of the station is suitable for some agricultural or construction purposes and also may be used for flushing WC.

3- Transportation

BAU is committed to fulfilling Sustainability and UI GreenMetric standards. It executes a sustainable continuous improvement plan aimed at decreasing the influx of vehicles onto campus. This is achieved through a range of initiatives, including restricting vehicle access in certain streets, minimizing parking spaces, and transforming some into green spaces. Additionally, staff, both administrative and academic, who commute from distant locations, group together and arrive in a single vehicle.



| | | | |
|-----------------------|--|--------------------------------|--------|
| Policy Name: | Zero-Emission Vehicles (ZEV) policy on campus | | |
| Code: | BAU_046 | Published date: | 2023 |
| Reviewed date: | 2023 | Confidentiality status: | Public |
| Accreditation: | Quality Assurance Council | | |

Responsibilities:

| | |
|----------------------------------|---|
| Implementation: | All BAU's Academic Colleges, Administrative Units, Scientific Centers |
| Revision and improvement: | Development and Quality Assurance Center |

السياسة:

تلتزم جامعة البلقاء التطبيقية بتعزيز الاستدامة البيئية وتقليل الانبعاثات الكربونية، كجزء من الجهود العالمية والوطنية للتخفيف من التغير المناخي والمساهمة في تحسين جودة الهواء، وذلك من خلال العديد من المشاريع والبرامج والمبادرات كالتشجيع على استخدام المركبات منخفضة الانبعاثات وخدمة الانبعاثات جنباً إلى جنب مع حلول النقل البيئية، وتقديم برامج أكاديمية تركز على المبادئ والتطبيقات العملية المتعلقة بالتغير المناخي والتقليل من الانبعاثات الكربونية، والتحول في منظومة النقل في الجامعة الى الاعتماد على المركبات قليلة أو عديمة الانبعاث، والمساهمة في تطعيم الأجيال القادمة على تبني خيارات النقل الصديقة للبيئة والمساهمة بنشاط في مستقبل أكثر استدامة.

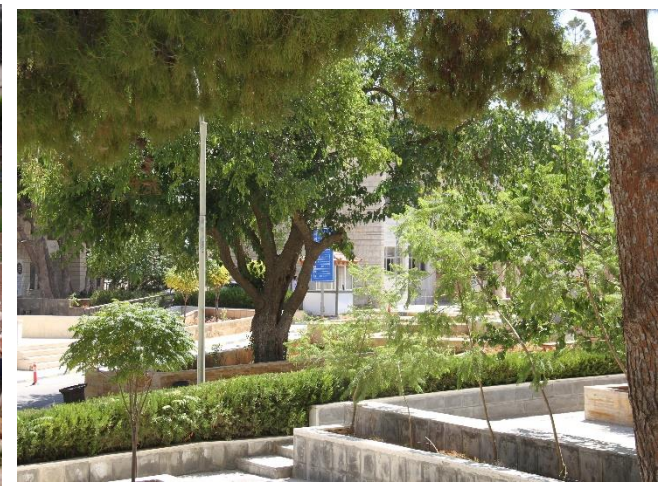
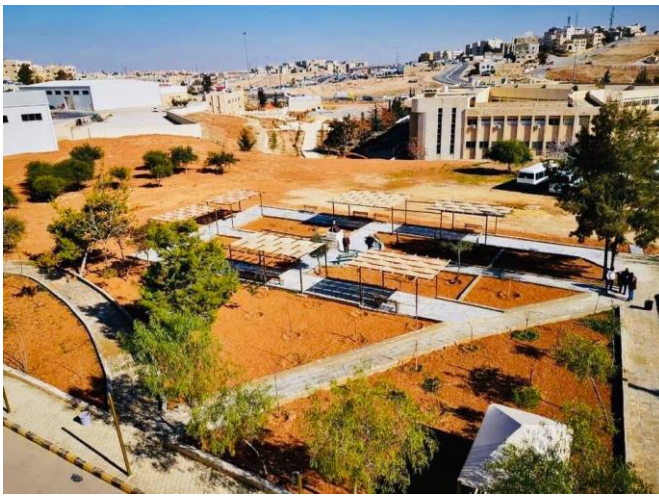
Policy:

Al-Balqa Applied University (BAU) is committed to promoting environmental sustainability and reducing its carbon footprint. As part of broader efforts to mitigate climate change and improve air quality, by undertaking numerous initiatives, programs, and projects aimed at reducing greenhouse gas (GHG) emissions. These comprehensive efforts encompass the promotion of low and zero-emission vehicles alongside alternative transportation solutions. Furthermore, BAU is actively introducing academic programs that integrate principles and practical applications concerning climate variability and change in addition to inspiring next generations to embrace eco-friendly transportation choices and actively contribute to a more sustainable.

Scope:

BAU's Zero-Emission Vehicles (ZEV) policy on campus is applied to BAU's faculty staff.

Zero-Emission Vehicles (ZEV) policy on campus



Sample of gardens area

BAU is actively pursuing the achievement of the **fourth Sustainable Development Goal (Quality Education)**. This is being done by offering inclusive education that enhances the competencies, skills, and abilities of all learners, irrespective of gender, race, or religion. The aim is to ensure that all individuals have access to lifelong learning opportunities, supported by flexible and diverse learning approaches. BAU is committed to providing an inclusive educational environment that helps individuals overcome any barriers hindering their educational pursuits, including housewives, people with disabilities, those residing in remote rural areas, and working individuals unable to enroll in traditional educational programs. Additionally, the university offers open educational resources such as educational platforms and a global database that aligns with international education standards, guaranteeing the attainment of accredited and internationally recognized certificates.

BAU is expanding its outreach by working directly with communities. Recognizing the importance of teaching the next generation to incorporate sustainability into their lives, the university offers many courses that cover all aspects of sustainability (environmental, social, and economic); through its study plans, the university demonstrates its supportive commitment to all aspects of sustainability. BAU strives to incorporate sustainability concepts into its study plans as actual practices.

In recent years BAU has developed a number of diplomas directly related to sustainable development, such as diploma in renewable energy, smart buildings, organic agriculture and wastewater treatment.

Samples Courses/Subjects Related to Sustainability Offered

| Course name | Description |
|------------------------|---|
| Drinking water quality | <p>This course is designed to introduce students to the main aspects of drinking water supply and quality as different water standards are explained theoretically in class. The laboratory analysis related to each parameter is then carried out. The course begins with an extensive review related to aqueous chemistry. Elements, radicals, and compounds present in or interacting with water and gas solubility in water. The course also discusses types and sources of pollution, changes in water quality, and water quality standards. Students also learn about water treatment such as mixing, flocculating, sedimentation, turbidity removal, filtration, softening, taste and odor control, and iron and manganese removal. All the common chemical indicators and analyzes of water such as conductivity, chloride, alkalinity and turbidity, sulfate, phosphorous, nitrate, iron and manganese removal and determination of dissolved material content and removal are presented in class and then students carry out experiments in the water laboratory under the supervision of the course instructor and safety procedures in the laboratory are well applied. Students are distributed into groups to carry out water experiments. After each lecture in the laboratory, the students must submit a report of the implemented experiment to the instructor for evaluation</p> |
| Food Safety | <p>Introduction to the concept of food hygiene and its importance. Food –borne infections and intoxication and the problem of residues in foods. Hygienic requirements in food production and harvesting areas and in food establishments with emphasis on hygienic food handling, processing, and storage. Personal hygiene and health requirements, cleaning and disinfecting and pest control as well as the application of hazard analysis critical control point (HACCP) system in food establishments, and workplace safety standards.</p> |

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| Climate Change and Sustainable Development | This course covers several aspects of defining climate change, its causes and effects on environmental and economic resources, and its connection to sustainable development and food security. This course covers the concepts of ecological sensitivity, climate models, and the prevailing pattern in Jordan. Methods of benefiting from cerebral information and how to obtain and process it are among the most important axes of this course. The role of geographic information systems and the mechanism of harnessing this technology to study this phenomenon and benefit from the environmental and climatic simulation will be addressed to solve problems related to drought, desertification, water scarcity, and pollution in Jordan |
| Ecology and Sustainable Production | This course deals with main principles of sustainable agriculture, as well as, with farming production systems that aim to enhance the health of the environment, natural resources and improve horticultural farm income. This course will also, provide a base of knowledge of the principles of alternative horticulture farming systems including soil biological processes (compost, humus, fertility and pest management). |
| Health, Safety, and Professional Environment | The overall aim of this course is explaining the work environment and outlining the methods of protecting people and others at work. It provides examining the most commonly known dangers of distinguishing dangers of chemical and biological materials, falling from high floors, physical dangers, fire, electricity, other types of dangers, and how they influence health, work safety, controlling dangers and risks, in order to reduce the potential damage in case of any accident. The course also explains the hierarchy of dangers control processes, methods and techniques of personal safety, first aid methods in case of human causalities, and knowing the Jordanian legal requirements and national codes for protecting workers and employees. |
| Waste Management and Composting | Integrated sustainable waste management; Organic waste generation and characterization; Organic waste collection and transport; Organic waste treatment technologies; Science of composting; Composting technologies, compost quality, and its economic feasibility; Operating the composting |

| | |
|--|--|
| | technologies; Vermicomposting; Compost uses and global compost market; Case study composting; Governance of organic waste management; Impact of organic waste management on the environment. |
| Smart Lighting and Electrical Installations | Study and design of electrical wiring networks in the building by calculating the loads and the amount of lighting needed to illuminate the various facilities in it according to the standard specifications, components of household electrical wiring of one and three phase, electrical measurements, drawing and reading electrical diagrams, grounding, wireless electrical installations and smart home systems. |
| Renewable Energy Technologies | Introduction to renewable energy and the concept of energy generation and conversion, types of renewable energy, benefits of renewable energy, solar energy, wind energy, and smart electric grids. |
| Heating, Air Conditioning and Cooling Technologies | Acquiring heating and cooling skills, calculating thermal loads and cooling loads for buildings, the principles of psychometric and its use in air conditioning calculations in buildings, places of equipment placement and drawing plans, control systems for air conditioning and heating devices, and the use of renewable energy in heating and cooling. |
| Meteorology and Air Pollution | Structure of the atmosphere and its thermodynamics; water and its transformations; cloud formation; precipitation... etc. Current climate issues such as global warming. Fundamentals of air pollution, major pollutants, their sources and their effects (environmental, economic and health), air pollution from mobile/stationary sources and indoor air quality. Pollutant sampling and measurement devices, pollutant distributions and dispersal modes as well as available methods to control the pollutants. Relevant Jordanian air quality policies and standards and presents relevant case studies. |
| Hydrochemistry and Water Quality | Origin of water, properties, influence of soil and aquifer materials on groundwater quality. Classification and assessment of groundwater quality. Changes in drinking water quality and quality criteria, water pollution and physiochemical treatment. |
| Wastewater Treatment and Reuse: | Composition and characterization of wastewater and sludge, Wastewater microbiology, Municipal wastewater treatment systems including physical unit operations (physical treatment) and biological unit processes |

| | |
|---------------------------------------|---|
| | (biochemical treatment), treatment and disposal of sludge, and wastewater reuse. |
| Soil, Water, and Plant Relationships: | Basic relationships between soil, plant, and water that make it possible to better manage and conserve irrigation water. Review physical laws of solutions: vapor pressure, solution potential, and latent heat. Soil water terminology. Physical characteristics of soil, soil and water interactions, available soil water, and how plants use water to determine what crops to plant and when to irrigate. Review irrigation scheduling that determines when and how much water needs to be added to a crop's root zone to promote optimum yields. |
| Pests and Diseases of Honeybees | This course is designed to contribute to the enjoyment and profitability of honeybees by giving you the knowledge and skills to recognize and manage their pests and diseases. |
| Organic Farming | Method of preparation and fermentation of organic materials, factors affecting its fermentation, effect of microorganisms, effect of organic materials, on the soil and its content of nutrient elements, its effect on production and quality of fruits, methods and time of applications. |
| Biological Control | Biological pest control concepts, environmental aspects, ecology, and strategies. Conservation and augmentation of natural enemies. Importation and colonization of natural enemies from abroad. Examples of successful utilization of parasitoids, predators and microbial agents. Biological control ecology. |
| Organic Chemistry | Study the chemical properties of the compounds is cyclic, clarify the nature of inter-linkages in the molecules, the study of public reactions and the stereochemistry of these compounds. Includes the study of alcohol and aromatic compounds, chemical reactions, substitution reactions of various types, some of these mechanical interactions, methods of analysis of different kinds of class to determine the composition of the binary compounds. |
| Principles of Psychology | Learn about the basic principles in psychology and the experimental origins on which psychological knowledge is based, a presentation of the concept of psychology, its origin, development and branches, with a focus on |

| | |
|---------------------------------|--|
| | psychology schools of learning, motivation, personality, memory, psychological disorders and intelligence. |
| Communication skills | Definition of communication, its nature, types and components, its models and characteristics, the efficiency of communication, studying some misconceptions about communication, mental perception and self-concept, the relationship between verbal communication and non-verbal communication, and writing a CV and interview. |
| Principles of plant protection. | The course is designed to familiarize students with the principles of plant protection including plant pathology, entomology, pesticides and weeds and their control. It will focus on the basic aspects of entomology and plant diseases, identify the pesticides and their main groups. In addition its focus on the weeds morphology and taxonomy, the bad effects and their control. |
| Agriculture in Jordan | This course covers topics related to the development and development of agriculture and its global, Arab and local importance, agricultural climate, elements of plant production in rainy and irrigated areas, animal production, marketing of agricultural products, water sources and their uses. Agricultural operations used. Agricultural pests and methods of combating them, agricultural mechanization, food industries. Institutions and bodies working in the agricultural service in Jordan. |
| Environment and society | The proposed course provides a general and comprehensive description of the environment: its definition, evolution, and the benefits that can be achieved through preserving environmental resources. In addition to addressing the relationship between society and environmental resources. The course also discusses topics known as the environmental reality in Jordan in terms of the nature and types of ecosystems, the most important environmental problems facing Jordan and their implications for society in general, not only from an environmental aspect, but also from a health, social, economic and developmental aspect. |
| General entomology | Phylum Arthropoda and its main classes. External anatomy including head, thorax, abdomen, and their appendages. Internal anatomy including digestive, endocrine, respiratory, circulatory, nervous, and reproductive |

| | |
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| | systems. Development, metamorphosis, and insect taxonomy are also covered. |
| Principles of Microeconomics | This course is an introductory course that covers fundamentals of Microeconomics with major emphasis on the theory of the market system. The course introduces economic concepts and analysis, demand and supply analysis, elasticity concepts, theories of the individual and the firm behavior mainly consumer and producer choice and how they interact to determine prices, output and resource allocations. The course also covers market structure in particular competition, monopoly, monopolistic competition and oligopoly. |
| Economic Feasibility Studies and Projects Evaluation | This course provides an introduction to the theory and practice of cost-benefit analysis and its link to basic economic and financial theory. Topics include: discounting and the valuation of benefits and costs, projects' appraisal phases including; economic, market and financial study, risk analysis, time value of money, and criteria for projects evaluation. Students will analyze and investigate contemporary cases from areas in economics and finance that are related to public policy issues and private projects. |
| Environmental Resources Management | Basic principles of environmental management; Environmental and sustainable development objectives; Nature's ecosystem services; Global environmental trends and issues Complexity; Managing biodiversity; pest and weed management; Soil, sediment, air and water – environmental degradation; Overview of environmental resources management assessment; Production, consumption, urbanization and extractive industries; The ecosystem approach and adaptive management; Strategic Management and SWOT Analysis. |

BAU has implemented that through faculties, scientific centers, the Students Affairs Deanship, the Local Community Development Unit by supporting all initiatives and student's organizations related to sustainability that produced several activities.



Orphans clothing campaign



Orphans IFTAR in many sites



Career Day



Training programs in cooperation with the Business Development Center (BDC)



Students field visits





Training course: Principles of treatment with bee products, a scientific lecture



A television session with BAU's population on the reality and effects of climate change on Jordan



Participation in the International Conference on Climate Change and Food Security



World Civil Defense Day



Breast cancer awareness activity



A series of awareness lectures in schools in cooperation with community police



Workshops : Mushroom production

Workshop: Digital skills for women



A training workshop in honeybees' production

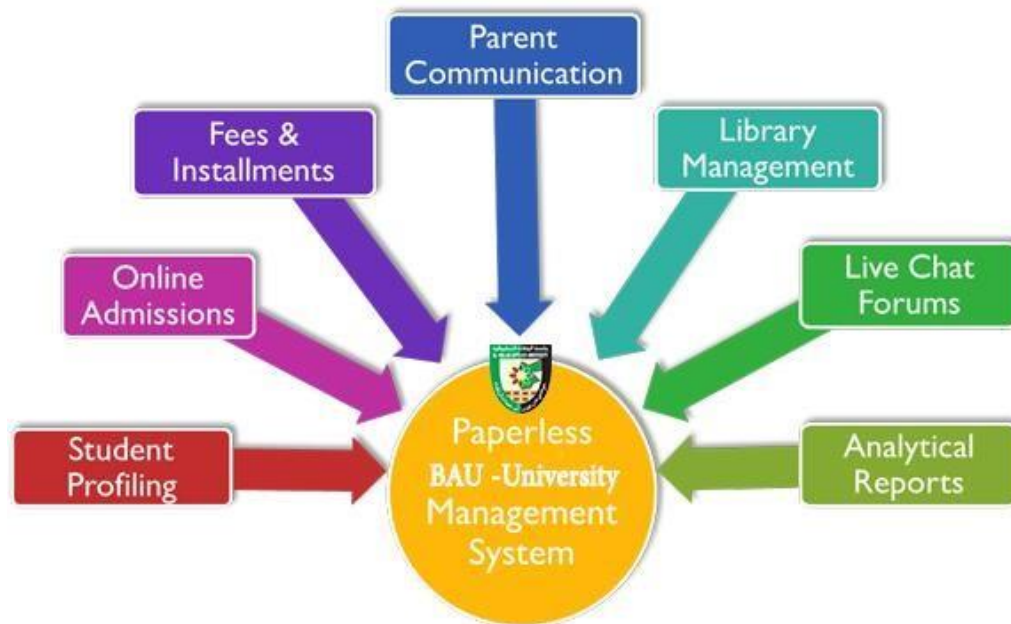
Also, Serving the local community is one of three aims for Al-Balqa Applied University addition to teaching and scientific research. The university also adopts the United Nations' sustainable development goals through local communities outreach and solve their problems.

4- Waste

The University implements recycling and sorting programs for two- third of its waste through several initiatives, allowing students, faculty and administrative staff to put waste in suitable containers (sorting of waste), which can be easily recycled.

The University has implemented a number of policies and programs to reduce the use of paper, including more than three programs to reduce the use of paper and plastic on campus, which reduces the rate of paper combustion and thus carbon dioxide emissions:

- 1- Electronic Correspondence (activating e-mail and electronic correspondence system), paperless university.
- 2- E-learning system and electronic tests.
- 3- Recycling paper by assembling it in some special containers.
- 4- Rather than using paper cups or bottled water, the university encourages employees to use coffee mugs by distributing mugs with the university's logo on special occasions and Canvas bags.
- 5- Reduce paper usage by duplex printing and check the correctness of data before printing.
- 6- Reduction the number of examinations (mid-term exam + final exam, early there were three exams first, second and final exams).



The University adopts a number of policies to reduce the use of paper

The University produces Compost using organic waste (Dead plants) and use carpentry workshop remains (Mulch) after treatment in agricultural purposes Figure 19. There are a number of initiatives from the student population concerning organic treatment, namely; digester for producing methane gas using organic waste. Since the university encourage innovation, a proposal for recycling organic waste is expected to see light in the near future within at least one of the university's campuses. The University disposes the inorganic wastes resulting from the scientific laboratories, the wastes treated through specialized companies and the disposal of damaged electrical and electronic equipment and devices through a tender.



Compost Operations Training Course

There are several initiatives from the student population regarding organic treatment, such as a digester for producing methane gas from organic waste, because the university encourages innovation and tries to spread environmental awareness among its population, particularly students.



Recycling Organic Waste Project

Management of Inorganic Waste Treatment at BAU achieved through the following actions:

1. The university provides a place for the collection of inorganic waste (waste electrical and electronic equipment) and offer a bid to recover valuable precious metals and rare earth elements through these tenders.
2. Enhancing awareness among university population about the advantage of collection and recycling of electrical and electronic waste.
3. BAU disposes a big ratio the inorganic wastes resulting from the scientific laboratories, the wastes treated through specialized companies and the disposal of damaged electrical and electronic equipment and achieved accomplished as mentioned above devices through a tender.



Recycling inorganic waste

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