



## EDUCATION FOR SDGs



Communications and Networks Department: SDGs Report (Teaching, Outreach activities, Research)

Teaching

Course	Instructor	SDG#	Relevance	Evidence
CME 241: Signals and Systems	Dr. Almakhles	NA	Not directly relevant	NA
CME 451: Wireless Communication	Dr. Marey	9	A course that covers the fundamentals of wireless communications with emphasis on wireless channel modeling; digital modulation in wireless channels; diversity <b>techniques</b> ; multiple access techniques; multicarrier transmission, multiple antenna systems, the cellular concept; overview of current wireless communications systems.	Course syllabus
CME 342: Communication Theory	Dr. Marey	9	This course covers the fundamental principles underlying the <b>analysis</b> and <b>design</b> of digital communication systems. We introduce the fundamental probability concepts that are used during the course. We discuss the processes of sampling, quantization, and digital pulse modulation including pulse code modulation, pulse differential modulation, and delta modulation. We also cover the digital base-band transmission by focusing on the effects of channel noise and bandlimited channel bandwidth on the performance of a system. In addition, we deal with the data detection problem of digital signals through the concept of matched and correlation filters.	Course syllabus
CME453 Microwave Communication	Dr. Mourad	7	Design the microstrip, directional coupler, and <b>power</b> dividers.	Course syllabus
CME 344 Antenna and Propagation		7	Calculate the antenna parameters like gain, input impedance, <b>radiated power</b> and radiation resistance. Describe radiation mechanism, i.e. how <b>electromagnetic</b> fields are generated, guided, and radiated.	Course syllabus
CME 341 Electromagnetics II		7	Calculate the percentage of electromagnetic <b>energy</b> reflected and transmitted when wave propagation transmitted from medium to another medium or along transmission lines. Analyze the Maxwell's equations to find the <b>electric</b> and magnetic field components in different media.	Course syllabus
CME421 Internet Engineering and Web Programming	Dr. Moustafa	9	This course covers the fundamentals of Major protocols on the internet, <b>new technologies</b> introduced on the internet and quality of service, routing on the internet, network security and firewall <b>design</b> as well as application protocols. Major <b>techniques</b> used in Web Servers also will be covered and programming and maintenance of Web, firewalls and proxy Servers.	Course syllabus
CME 322 Network Analysis and Design		7	This course is focusing on the relevant and state-of-the-art networking protocols and architectures. The focus is on the protocols used in the <b>modern networked</b> systems including wireless and mobile networks. The goals of the course are to build on basic networking course material in providing a deep understanding of existing <b>technology</b> with concrete experience of the challenges through a series of exercises. The course is divided into four parts where the first two parts aim to provide deep understanding of protocols, architectures and segment structures at different layers of the protocol stack specifically transport and network and link layers. The third part will focus on the application layer and	Course syllabus

			services/applications. The final part is designed to provide a comprehensive understanding and evolution of the wireless networks. Describe different KPIs such as delay, loss, throughput, and <b>energy consumption</b> in network systems, and recognize different type of network switching mechanisms such as packet- and circuit-switching	
CME 211 Embedded System	Dr. Walid		Embedded systems are the core engine driving smart devices, systems with artificial intelligence, and the internet of things. In this course, students learn how to design power efficient embedded systems integrated on one chip built with "CMOS" technology which is well known for its very low energy consumption as compared to old technologies such as TTL and ECL families. In this way, students appreciate the importance of electric power consumption of electronic devices and how to minimize it to create a more sustainable environment.	
CME441 Communication Systems II			Sustainable Wireless Systems (SWS) are those systems which are designed in a way that minimizes their energy consumption, increases the usage of recycled material, minimizes harmful electromagnetic radiation and makes them compatible with environmental standards. SWS attracted enormous research efforts over the last few decades. Those efforts helped in developing greener wireless systems which provide us today with highly reliable connectivity at lower cost and lower energy consumption such as 4G LTE systems and their future counterparts, namely 5G and 6G systems. In this course, the students study the basics of communication systems and how to analyze/design systems in regards to their frequency usage and energy consumption.	syllabus
CME442 Information and Coding Theory			This course addresses the problem of designing efficient and reliable communication systems through introducing the field of information theory. Information theory helps us quantify the amount of information used in a certain communication network. Information theory enables the theoretical analysis of how much redundant information is transmitted or stored by a given system. Information theory dictates the rules for optimal data compression and power reduction a designer can apply in a given communication networks. Lossy and lossless data compression are essential tool in reducing the footprint of a wireless systems and minimize its electric energy consumption. The well-known techniques of MPEG and JPEG used for video and photo compression are taught in the syllabus of this course. Those techniques help the student recognize the critical challenge of achieving reliable communication with high quality of service while maintaining the optimal level of resource management in terms of cost, bandwidth usage and energy consumption.	syllabus
CME111 Logic design fundamentals	Dr. Maged	4	This course introduces digital systems design concepts. Topics include basic combinational building blocks and design methods to construct synchronous digital systems; alternative representations for digital systems; standard logic (SSI, MSI) vs. programmable logic (PLD, FPGA); finite state machine design; digital computer building blocks as case studies; Introduction to computer-aided design software in VHDL. The course also includes a design project which helps in supporting <b>practical learning</b> and <b>long life learning</b>	

## Outreach

Activities	SDG #	Relevance	Evidence
Saudi Broadcasting Authority Field Trip	4	<p>{practical learning} {technical training}</p> <p>The Communications and Networks Department (CNE) students visited the Saudi Radio and Television Authority under the supervision of two faculty members, Dr. Walid Dyab and Dr. Mourad Rizk. The visit aims to provide the students with an opportunity to familiarize themselves with the technical work environment of the Radio and Television Authority and its stations and to fill the gap between the academic studies and the work field.</p> <p>In the trip, the students experienced the value of reducing energy consumption of wireless systems. They saw the power amplifiers necessary to cover the whole area of KSA with radio services. They experienced the benefits of transferring to digital technology which enables the same service but with huge reduction in power consumption, which is necessary to build a more sustainable environment.</p>	<a href="https://www.psu.edu.sa/en/CE/news/315">https://www.psu.edu.sa/en/CE/news/315</a>

## Research

Research	Instructor	SD G#	Relevance	Evidence
Renewable Energy	Dr. Dhafer & Dr. Jagabar	7	<p>With the high population growth and recent development of industries, the demand and utilization of electric energy are increasing day by day. Saudi Arabia has taken the necessary steps to balance the existing resources and meet the National Renewable Energy Program (NREP) demand. The development of the renewable energy sector is one of the goals of Energy &amp; Sustainability, Vision 2030. However, as per tropical conditions, Saudi Arabia is more exposed to sunlight. It has many open places where large scale photovoltaic (PV) power plants can be installed. The Saudi Arabia government is paying more attention to increasing the renewable energy sector through NREP. To focus on the 2030 vision, the large-scale photovoltaic, solar thermal power plant, and distributed energy resources contribute more to reducing the burden on the primary grid. The objectives of Vision 2030, the kingdom has given importance to solar energy to meet electricity demand and reduce carbon emissions.</p> <p><i>Photovoltaics Applications (PV)</i></p> <p>Photovoltaic energy converts solar energy to useful electrical energy by photovoltaic principle. Each solar panel consists of a group of solar cells that convert sunlight to electricity. The PV system can be used in a wide range of applications ranging from milliwatts to megawatts of power, such as solar-powered calculators to large power plants and other applications like what we see on some buildings' roofs houses as well as street lighting,</p>	<a href="https://doi.org/10.1038/s41598-021-84531-z">https://doi.org/10.1038/s41598-021-84531-z</a>

			<p>traffic signs. Note that PV can be stored during the daytime and used after sunset. The individual dwellings and mosques can participate to install a roof PV system to meet the vision 2030 goal. In Saudi Arabia, the Sakaka Solar Power Plant Project in Al Jawf is under the Ministry of Energy and was the first Renewable Energy project. The plant uses solar energy through photovoltaic technology (PV) to generate electricity, and it produces a 300MW production capacity and 606K ton reduction of carbon. Since the kingdom aims to share 50% of electricity from a renewable energy source, this encourages the young researcher to support the energy sector. In this way, we have published a scientific article in the journal <i>scientific report -nature publisher</i>, which is themed as rooftop photovoltaic applications. Our research work deals with developing a novel power electronics interface. The presented research work has a low cost and high efficiency. It is more suitable for low to medium power applications like rooftop PV systems, street lights, and water pumping systems. Our future research is to develop a new power electronics interface for the grid-tie rooftop photovoltaic application with the integration of energy storage. This power electronics interface provides high efficiency, low cost, miniature size and high reliability, and this research can be extended to high voltage and high power applications like the Sakaka solar power plant to participate in our national vision 2030.</p>	
Smart Systems Engineering Lab	Dr. Moustafa M. Nasralla	7	<p><b>Sustainable Virtual Reality Patient Rehabilitation Systems with IoT Sensors Using Virtual Smart Cities</b></p> <p>To develop sustainable rehabilitation systems, these should consider common problems on IoT devices such as low battery, connection issues and hardware damages. These should be able to rapidly detect any kind of problem incorporating the capacity of warning users about failures without interrupting rehabilitation services. A novel methodology is presented to guide the design and development of sustainable rehabilitation systems focusing on communication and networking among IoT devices in rehabilitation systems with virtual smart cities by using time series analysis for identifying malfunctioning IoT devices. This work is illustrated in a realistic rehabilitation simulation scenario in a virtual smart city using machine learning on time series for identifying and anticipating failures for supporting sustainability.</p>	<a href="https://www.mdpi.com/2071-1050/13/9/4716">https://www.mdpi.com/2071-1050/13/9/4716</a>
Smart Systems Engineering Lab and Renewable energy lab	Dr. Moustafa M. Nasralla and Dr. Dhafer	4, 9	<p><b>Futuristic Trends and Innovations for Examining the Performance of Course Learning Outcomes Using the Rasch Analytical Model</b></p> <p>The literature on engineering education research highlights the relevance of evaluating course learning outcomes (CLOs). However, generic and reliable mechanisms for evaluating CLOs remain challenges. The purpose of this project was to accurately assess the efficacy of the learning and teaching techniques through analysing the CLOs' performance by using an advanced analytical model (i.e., the Rasch model) in the context of engineering and business education. This model produced an association pattern between the students and the overall</p>	<a href="https://www.mdpi.com/2079-9292/10/6/727">https://www.mdpi.com/2079-9292/10/6/727</a>

			<p>achieved CLO performance. The sample in this project comprised students who are enrolled in some nominated engineering and business courses over one academic year at Prince Sultan University, Saudi Arabia. This sample considered several types of assessment, such as direct assessments (e.g., quizzes, assignments, projects, and examination) and indirect assessments (e.g., surveys). The current research illustrates that the Rasch model for measurement can categorise grades according to course expectations and standards in a more accurate manner, thus differentiating students by their extent of educational knowledge. The results from this project will guide the educator to track and monitor the CLOs' performance, which is identified in every course to estimate the students' knowledge, skills, and competence levels, which will be collected from the predefined sample by the end of each semester. The Rasch measurement model's proposed approach can adequately assess the learning outcomes</p>	
Smart Systems Engineering Lab	Dr. Moustafa M. Nasralla	7, 11	<p><b>Smart Cities to Improve Mobility and Quality of Life of the Visually Impaired</b></p> <p>The rapid pace of innovation and advances in technological research has given hope to the visually impaired people (VIP) to find ways to move around smart cities and enjoy a better quality of life (QoL). There are around 110 million people suffering from visual impairments worldwide, and research will continue to be conducted to discover innovative solutions to improve their mobility. The rise in smartphones and wearable devices, along with the surge in the adoption of artificial intelligence (AI), the Internet of Things (IoT), and virtual and augmented reality (VR)/(AR), has provided aspirations for VIP to enjoy a better QoL. Moreover, smart cities also support the concept of sustainable economic growth and the well-being of their citizens; therefore, their development relies on strong ICT infrastructure. A number of studies have already tested the use of these technologies, showing optimistic results. The main sectors that could be improved to cater for VIP in smart cities are public areas, transportation systems and home systems. This chapter provides a comprehensive review and recommendations on how a smart city can provide better QoL for VIP in the near future.</p>	<a href="https://link.springer.com/chapter/10.1007/978-3-030-16450-8_1">https://link.springer.com/chapter/10.1007/978-3-030-16450-8_1</a>
Smart Systems Engineering Lab	Dr. Maged	9	<p><b>Data usage is increasing day by day and there is a need to increase the transmission capacity. Fiber cables help in providing high capacity channels for data transmission. However, fiber technology becomes expensive in some installation scenarios. Optical wireless is a good alternative to reduce the cost, however, it is subject to some technical challenges that require more research in order to develop a technology suitable for industry. The SSE lab is developing solutions using artificial intelligence to support optical wireless technology development. Such solutions help in resilient communication systems and then resilient cities.</b></p>	<a href="https://www.osapublishing.org/oe/fulltext.cfm?uri=oe-29-7-10967&amp;id=449497">https://www.osapublishing.org/oe/fulltext.cfm?uri=oe-29-7-10967&amp;id=449497</a>
Renewable Energy LAB	Dr. Mahajan sagar Bhaskar	7	<p><b>Non-Isolated DC-DC Converters for Renewable Energy Applications</b></p>	<a href="https://www.routledge.com/Non-Isolated-DC-">https://www.routledge.com/Non-Isolated-DC-</a>

		<p><b>(1st Edition of Book)</b></p> <p>Photovoltaic (PV) energy generation is an excellent example of large-scale electric power generation through various parallel arrangements of small voltage-generating solar cells or modules. However, PV generation systems require power electronic converters system to satisfy the need for real-time applications or to balance the demand for power from electric. Therefore, a DC-DC power converter is a vital constituent in the intermediate conversion stage of PV power. This book presents a comprehensive review of various non-isolated DC-DC power converters.</p> <p>Non-isolated DC-DC converters for renewable energy system (RES) application presented in this book 1st edition through a detailed original investigation, obtained numerical/experimental results, and guided the scope to design new families of converters:</p> <ul style="list-style-type: none"> <li>● <i>DC-DC multistage power converter topologies,</i></li> <li>● <i>Multistage "X-Y converter family",</i></li> <li>● <i>Nx IMBC (Nx Interleaved Multilevel Boost Converter),</i></li> <li>● <i>Cockcroft Walton (CW) Voltage Multiplier-Based Multistage/Multilevel Power Converter (CW-VM-MPC) converter topologies, and</i></li> <li>● <i>Z-source and quasi Z-source.</i></li> </ul> <p>Above solutions are discussed to show how they can achieve the maximum voltage conversion gain ratio by adapting the passive/active component within the circuits. For assessment, we have recommended novel power converters through their functionality and designs, tested and verified by numerical software. Further, the hardware prototype implementation is carried out through a flexible digital processor. Both numerical and experimental results always shown as expected close agreement with primary theoretical hypotheses.</p> <p>This book offers guidelines and recommendation for future development with the DC-DC converters for RES applications based on cost-effective, and reliable solutions.</p>	<p><a href="https://ieeexplore.ieee.org/document/9338138">DC-Converters-for-Renewable-Energy-Applications/Blaabjerg-Bhaskar-Padmanaban/p/book/9780367654580</a></p>
EMG Research group	Dr. Walid and Dr. Mourad	<p>7</p> <p><b>Ridge Gap Waveguide Enabled Wireless Power Transfer for Electric Vehicle Applications</b></p> <p>A technique for wireless power transfer based on a ridge gap waveguide structure is proposed. This technique is named as "Contact-Less Transmission-Line Wireless Power Transfer, CLTL-WPT". The idea is stemmed from the fact that the ridge gap waveguides are low loss transmission lines which consist of a base and a cover which are not in ohmic contact, thus allowing for an air gap in between. The theoretical efficiency of the proposed wireless power transfer is well compared to the conventional methods. The proposed technique is presented in the context of a high-power wireless charger for electric vehicle applications. An analytical design procedure of the ridge gap waveguide with respect to such an application is shown in details. The presentation is supported with full wave simulations. The main challenges and limitations are addressed.</p>	<p><a href="https://ieeexplore.ieee.org/document/9338138">https://ieeexplore.ieee.org/document/9338138</a></p>

**Engineering Management Department**  
**Sustainability Report 2020/2021 Academic Year**

**1) Teaching**

No.	Course	Instructor	Brief Description	Relevance to SDG
1	EM 304: Reinforced Concrete	Prof. Yasser Mansour	Students' design project for a multistory reinforced concrete structure. Through the project, students are requested to reach the <b>sustainable</b> design of a structure by following the international building codes.	SDG #11
2	EM 383 Building Construction	Dr. Ihab Katar	The course includes the material selection, and the erection of building structures using <b>natural materials like timber and masonry as sustainable materials in the city construction projects</b> .  Also, it introduces the basic mechanical and electrical systems required in buildings for the <b>safety, health, comfort, and convenience of the occupants</b> .	SDG #3 SDG #11
3	EM 482: Construction Equipment and Methods	Dr. Ihab Katar	The course covers construction equipment and methods for civil/structural facilities with emphasis on equipment-paced operations including safety aspects. A part of the subject is oriented to preserve the <b>clean and green use of soil and rock in our built environment</b>	SDG #11
4	EM 474 Environmental Management	Dr. Hyuk Soo Son	This course surveys the scientific principles of environmental issues and <b>environmental</b> management practices, with attention to the <b>health of both humans and the ecosystem</b> .	SDG #3 SDG #6 SDG #13 SDG #14 SDG #15
5	CEE 241: Introduction to Environmental Engineering	Dr. Hyuk Soo Son	The course introduces the foundation of environmental science and engineering. It provides the key concepts in <b>water pollution, air pollution, hazardous waste, environmental legislation, and global atmospheric change</b>	SDG #3 SDG #6 SDG #13 SDG #14 SDG #15
6	Bio 101: Biology	Dr. Hyuk Soo Son	The course covers major fields and fundamental principles of biology. Fundamental studies in biology emphasizing the <b>unity and diversity of human, animal, and plant life</b> .	SDG #3 SDG #14 SDG #15
7	EM 477: Transportation Systems Management	Dr. M. Ezzat	The course explores the <b>sustainable</b> transportation modes and the possible way for switching to sustainable mobility	SDG #9 SDG #11
8	EM 458: Product Design and Development	Dr. Tamer Sebaey	This course covers product development in a <b>sustainable</b> way that starts from an idea until being a real product including the financial analysis and the life cycle assessment of the product.	SDG # 17 SDG # 7 SDG # 8



9	EM 457 Lean Manufacturing	Dr. Abdelhadi	Lean manufacturing course, several topics covered are SDG related, such as JIT where students are taught to make whatever we need at the time we need it in the amount needed. <b>This will keep the inventory at the minimum and meets the goals.</b>	SDG #4 SDG # 12
10	EM 438 Modeling and Simulation	Dr. Khaled Akkad	This course covers <b>improving the efficiency of manufacturing systems</b> using simulation software. A more efficient system may contribute to reduced material consumption and improved production patterns.	SDG #12
11	EM 469 Human Factors	Dr. Hassan Mehboob	This course deals with the ergonomic design and time studies to <b>increase the efficiency, increase the safety and health of the workers.</b>	SDG# 3
12	ETHC 305 Ethical & Social Aspects of Engineering	Majed Alsubiei	Introduction to engineering ethics. Topics include ethical <b>theories, professional engineering responsibility, codes of ethics, ethical assessment, conflicts of interest, risk and safety, loyalty &amp; dissent, as well as overarching professional concerns</b> , methodologies to solve ethical problems.	SDG #5 SDG #8 SDG #10
13	CEE 205 Introduction to Design	Majed Alsubiei	This course presents an introduction to design to offer students a <b>solid composition for the design procedure that they can use with a range of design techniques</b> and software bundles. It is constructed to educate students/designers by doing hands-on design exercises & providing a range of means essential for their designs.	SDG #9 SDG #11 SDG #12
14	EM488 Project Planning, Scheduling and Control	Basel Sultan	The course teaches the concepts of planning, scheduling and controlling construction projects, however, assure that the planning activities and resources for construction projects consumed on the project are used efficiently and not wasted, by taking into consideration the <b>principles of sustainability</b> , which should be integrated during planning and execution process throughout the project.	SDG #9 SDG #11
15	EM326 Project Management	Shabir Hussain	The student will learn the key understanding about the <b>project management.</b>	SDG 9 SDG 11

## 2) Research

### A) Articles

No.	Article Title	Authors	Journal/Volume	Relevance to SDG #
1	Mechanical Properties of Concrete with Recycled Concrete Aggregate and Fly Ash	<b>Ihab Katar, Yasser Ibrahim, M Abdul Malik, and Shabir Khahro</b>	Recycling, 6(2), pp.1-13.	SDG # 3 SDG # 11
2	Towards sustainable pedestrian mobility in Riyadh city, Saudi Arabia A case study	<b>Basel Sultan, Ihab Katar, Mohammad Al-Atroush</b>	Sustainable Cities and Society, Volume 69, 102831	SDG #11 SDG #13
3	A Novel Application of the Hydrophobic Polyurethane Foam: Expansive Soil Stabilization. <a href="https://doi.org/10.3390/polym13081335">https://doi.org/10.3390/polym13081335</a>	<b>Al-Atroush, Mohamed E.; Shabbir, Omar; Almeshari, Bandar; Waly, Mohamed; Sebaey, Tamer</b>	Polymers 13, no. 8: 1335.	SDG #9 SDG #15 SDG #12
4	IN-PERSON AND VIRTUAL BALANCED TECHNIQUE FOR GEOTECHNICAL ENGINEERING LABORATORIES.	<b>M.E.Al-Atroush</b>	Proceedings of 13th annual International Conference of Education, Research and Innovation (ICERI 2020), 9th-10th November 2020.	SDG #4
5	<i>Construction industry sustainable development indicator for low-income developing countries: Yemen as a case study,</i>	<b>Basel Sultan &amp; Wael Alaghbari</b>	International Journal of Construction Management, 24 Jul 2021  <a href="https://doi.org/10.1080/15623599.2021.1951429">https://doi.org/10.1080/15623599.2021.1951429</a>	<i>SDG11</i>
6	Finite element analysis of multistory structures subjected to train-induced vibrations considering soil-structure interaction	<b>Yasser Ibrahim and Marwa Nabil</b>	Case Studies in Construction Materials 15 (e00592), 1-18	SDG # 3 SDG # 11
7	Several Articles that address the safety enhancement during an accident by structural design	<b>Tamer Ali Sebaey</b>	<a href="https://doi.org/10.3390/polym12092028">https://doi.org/10.3390/polym12092028</a>  <a href="https://doi.org/10.1016/j.i struc.2020.08.082">https://doi.org/10.1016/j.i struc.2020.08.082</a>  <a href="https://doi.org/10.1016/j.c ompstruct.2020.112910">https://doi.org/10.1016/j.c ompstruct.2020.112910</a>  <a href="https://doi.org/10.1002/p c.24597">https://doi.org/10.1002/p c.24597</a>  <a href="https://doi.org/10.1016/j.t ws.2017.03.016">https://doi.org/10.1016/j.t ws.2017.03.016</a>	SDG # 3

8	Analyzing Sustainability Awareness among Higher Education Faculty Members: A Case Study in Saudi Arabia.	<b>Bandar Alkhayyal, Wafa Labib, Talal Alsulaiman and Abdelhakim Abdelhadi</b>	<a href="https://doi.org/10.3390/su11236837">https://doi.org/10.3390/su11236837</a>	SDG #4 SDG #5
9	Learning style preferences of architecture and interior design students in Saudi Arabia: A survey	WafaLabib Irene Pasina, <b>Abdelhakim Abdelhadi</b> , Goze Bayram, Mohammad Nurunnabi	<a href="https://doi.org/10.1016/j.mex.2019.04.021">https://doi.org/10.1016/j.mex.2019.04.021</a>	SDG #4 SDG #5
10	Machine Learning Applications in Modelling and Analysis of Base Pressure in Suddenly Expanded Flows	Jaimon Dennis Quadros, Sher Afghan Khan, <b>Abdul Aabid</b> , Mohammad Shohag Alam, and <b>Muneer Baig</b>	Aerospace/8(318)	SDG #9
11	Investigation of tiny jet locations effect in a sudden expansion duct for high-speed flows control using experimental and optimization methods	<b>Abdul Aabid</b> , Sher Afghan Khan, Asif Afzal, and <b>Muneer Baig</b>	Meccanica/ Accepted	SDG #9
12	Structural analysis of three-dimensional wings using finite element method	<b>Abdul Aabid</b> , Muhammad Amir Mirza Bin Mohd Zakuan, Sher Afghan Khan, <b>Yasser E. Ibrahim</b>	Aerospace Systems/2021	SDG #9
13	Experimental and empirical investigation of a CI engine fuelled with blends of diesel and roselle biodiesel	Tikendra Nath Verma, Upendra Rajak, Abhishek Dasore, Asif Afzal, A. Muthu Manokar, <b>Abdul Aabid</b> , and <b>Muneer Baig</b>	Scientific Reports/11(1)	SDG #9
14	A Critical Review of Supersonic Flow Control for High-Speed Applications	<b>Abdul Aabid</b> , Sher Afghan Khan, and <b>Muneer Baig</b>	Applied Sciences (Switzerland)/11(6899)	SDG #9
15	Response surface analysis of nozzle parameters at supersonic flow through microjets	Turki Al-Khalifah, <b>Abdul Aabid</b> , Sher Afghan Khan, Muhammad Hanafi Bin Azami and <b>Muneer Baig</b>	Australian Journal of Mechanical Engineering/13(2)	SDG #9
16	A Systematic Review of Piezoelectric Materials and Energy Harvesters for Industrial Applications	<b>Abdul Aabid</b> , Md Abdul Raheman, <b>Yasser E. Ibrahim</b> , Asraar Anjum, Meftah Hrairi,	Sensors/21(4145)	SDG #9

		Bisma Parveez, Nagma Parveen and Jalal Mohammed Zayan		
17	Analysis of flows and prediction of CH10 airfoil for unmanned arial vehicle wing design  Abdul	<b>Abdul Aabid</b> , Lijana Nabilah Binti Khairulaman and Sher Afghan Khan	Advances in Aircraft and Spacecraft Science/8(2)	SDG #9
18	Multi Ceramic Particles Inclusion in the Aluminium Matrix and Wear Characterization through Experimental and Response Surface-Artificial Neural Networks	Ballupete Nagaraju Sharath, Channarayapattana Venkataramaiah Venkatesh, Asif Afzal, Navid Asfattahi, <b>Abdul Aabid</b> , <b>Muneer Baig</b> and Bahaa Saleh	Materials/14(11)	SDG #9
19	Experimental Investigation of the Friction Stir Weldability of AA8006 with Zirconia Particle Reinforcement and Optimized Process Parameters	Thanikodi Sathish, Abdul Razak R. Kaladgi, <b>Muneer Baig</b> and Bahaa Saleh	Materials/14(11)	SDG #9
20	A Review of Piezoelectric Material-Based Structural Control and Health Monitoring Techniques for Engineering Structures: Challenges and Opportunities	<b>Abdul Aabid</b> , Bisma Parveez, Md Abdul Raheman, <b>Yasser E. Ibrahim</b> , Meftah Hrairi, Nagma Parveen and Jalal Mohammed Zayan	Actuators/10(5)	SDG #9
21	Parametric Analysis of Adhesively Bonded Single Lap Joint Using Finite Element Method	<b>Abdul Aabid</b> , Sher Afghan Khan, Turki Al-Khalifah, Bisma Parveez, Asraar Anjum	Smart Innovation, Systems and Technology/chapter 65	SDG #9
22	Evaluation of the Infill Design on the Tensile Response of 3D Printed Polylactic Acid Polymer	Tanner David Harpool, Ibrahim Mohammed Alarifi, Basheer A. Alshammari, <b>Abdul Aabid</b> , <b>Muneer Baig</b> , Rizwan Ahmed Malik, Ahmed Mohamed Sayed, Ramazan Asmatulu, and Tarek Mohamed Ahmed Ali EL-Bagory	Materials/14(9)	SDG #9
23	CFD analysis of compressible flows in a convergent-divergent nozzle  Sher	Sher Afghan Khan, Omar Mohamed Ibrahim, <b>Abdul Aabid</b>	Materials Today: Proceedings/46	SDG #9
24	Studies on Flows Development in a Suddenly Expanded Circular Duct at Supersonic Mach Numbers	<b>Abdul Aabid</b> and Sher Afghan Khan	International Journal of Heat and Technology/39(1)	SDG #9

25	Statistical Analysis of Adhesive Bond Parameters in a Single Lap Joint System	Asraar Anjum, Jaffar Syed Mohamed Ali, Jalal Mohamed Zayan and <b>Abdul Aabid</b>	Journal of Modern Mechanical Engineering and Technology/7	SDG #9
24	Prediction of compressive strength of concrete incorporated with jujube seed as partial replacement of coarse aggregate: a feasibility of Hammerstein–Wiener model versus support vector machine	<b>Musa Adamu</b> , S. I. Haruna, Salim Idris Malami, M. N. Ibrahim, S. I. Abba and <b>Yasser E. Ibrahim</b>	Modeling Earth Systems and Environment	SDG #11
25	Durability performance of pervious concrete containing rice husk ash and calcium carbide: A response surface methodology approach	<b>Musa Adam</b> , Kingsley Oyime Ayeni, Sadi Ibarahim Haruna, <b>Yasser El-Husseini Ibrahim Mansour</b> , Sani Haruna	Case Studies in Construction Materials Volume 14, June 2021, e00547	SDG #11
26	Bioinspired porous dental implants using the concept of 3D printing to investigate the effect of implant type and porosity on patient's bone condition	<b>H Mehboob</b> , A Mehboob, F Abbassi, F Ahmad, AS Khan, S Miran	Mechanics of Advanced Materials and Structures	SDG #3
27	Occupational accidents: a comparative study of construction and manufacturing industries	<b>Shabir Hussain Khahro</b> , Tauha Hussain Ali, Nafees A Memon and <b>Zubair Ahmed Memon</b>	Current Science Volume 118; pp 243.	SDG #3
28	Pavement Management System Research output: A Scientometric Assessment	<b>Shabir Hussain Khahro</b> , <b>Zubair Ahmed Memon</b> , Nur Izzi Md. Yusoff Dr, Lillian Gungat, Muhamad Razuhanafi Mat Yazid	Library Philosophy and Practice (e-journal) April 13, 2020, pp; 41-54	SDG #3 SDG#11
29	Determination of Deflection Basin Using Pavement Modelling Computer Programs and Finite Element Method	Sri Atmaja P. Rosyidi, Asmah Hamim, Aizat Mohd Taib, Nor Azliana Akmal Jamadudin, <b>Zubair Ahmed Memon</b> , Nur Izzi Md. Yusoff and Mohd Rosil Hainin	Jurnal Teknologi (Science and Engineering); Volume 82; issue 4; pp 55-63	SDG #3 SDG #11
30	Potentiality of Industrial Waste as Supplementary Cementitious Materials in Concrete Production	Sajjad Ali Mangi, <b>Zubair Ahmed Memon</b> , Shabir Hussain Khahro, Rizwan Ali Memon and Arshad Hussain Memon	International Review of Civil Engineering (IRE. CE) Volume 11:issue 5; pp 214-221	SDG #3 SDG #11
31	Is Co-operative Education in Engineering is a Great Thought: An Evidence from an Undergraduate Study Program	<b>Zubair Ahmed Memon</b> , <b>Basel Sultan</b> and <b>Shabir Hussain Khahro</b>	Elementary Education Online, 2021 Volume 20, issue 5; PP116-121	SDG #4

B) Projects/Grants

No.	Project/Grant Title	Investigators	Organization	Relevance to SDG #
1	Fostering Pedestrian Ecomobility for Sustainable Urban Devel-opment: A Case Study, Riyadh City (processing article)	<b>Ihab Katar</b>	Sustainability journal	3, 11, 13
2	Designs and Optimizations of Geothermal Pile Systems for Tropical Climate Application.	<b>M.E.Al-Atroush</b>	Ministry of Higher education, Malaysia  Grant project No. FRGS/1/2021/TK0/UTP/02/22. Rule: CO-PI, 2021.	SDG #7 SDG #9 SDG #11 SDG #13
3	Enhancement of Pavement Thermo-mechanical Behavior Using Geothermal Energy-Harvesting System.	<b>M.E.Al-Atroush</b>  <b>Sebay T</b>  <b>Mansour Y</b>	Prince Sultan University,  SEED Project #74, 2021.	SDG #7 SDG #9 SDG #11 SDG #13
4	Production and mechanical Characterization of wood/polymer composites for the sustainability of kingdom resources	<b>Muneer Baig,</b> Ateekh Ur Rehman, Asiful H. Seikh	KACST	SDG #9 SDG #11
5	Design of composite energy absorption devises for automotive applications	<b>Tamer Ali sebaey</b>	A PSU project that addresses the safety during accidents after material aging	SDG#3
6	Experimental Study of Durability and Mechanical Properties of Concrete with Recycled Concrete Aggregate and Fly Ash	<b>Ihab Katar, Yasser Ibrahim, M Abdul Malik, and Shabir Khahro</b>	Prince Sultan University,  SEED Project	SDG # 3 SDG # 11
7	MEM Research Thesis	<b>Ammar Hattab,</b> <b>Basel Sultan</b>	PSU COE	SDG 8 SDG 9
8	MEM Research Thesis	<b>Meshri Fahad</b> <b>Alatiki, Basel Sultan</b>	PSU COE	SDG 8 SDG 9
9	MEM Research Thesis	<b>Abdulkarim Mater</b> <b>Alanazi, Basel Sultan</b>	PSU COE	SDG 8 SDG 9
10	MEM Research Thesis	<b>Abdulmalik A</b> <b>Bagader, Basel Sultan</b>	PSU COE	SDG 8 SDG 9

12	Production and mechanical characterization of wood/polymer composites for the sustainability of kingdom resources	<b>Muneer Baig, Abdulhakim AlMajid, Abdul Aabid, Bandar AlMeshari, M Abdulmalik</b>	Prince Sultan University, Seed Project	SDG 9 SDG 11
13	COOP course learning outcome Assessment Approach using Stakeholders Engagement	<b>Zubair Ahmed Memon, Basel Sultan, Shabir Hussain</b>	Prince Sultan University, SEED Project	SDG # 4
14	Carbon Footprint Quantification: A Case Study of an Academic Building	Muhammad Aashed Khan Abbasi, <b>Shabir Hussain Khahro,</b> Yasir Javed	Prince Sultan University, SEED Project	SDG 9 SDG 11
15	Cost Efficient Road Condition Assessment Approach for Developing Countries	<b>Shabir Hussain Khahro, Zubair Ahmed Memon,</b> Yasir Javed	Prince Sultan University, SEED Project	SDG 9 SDG 11

### 3) Events/Community Services

No.	Event	Participant faculty member	Audience	Relevance to SDG #
1	PSU-ASCE Student Chapter Participation in COVID-19 Mask Campaign	<b>M.E.Al-Atroush</b>	PSU students,	SDG #3
2	KAUST Future Composite Workshop "Crashworthiness Of Composite Structures For High Safety Standard"	<b>Tamer Sebaey</b>	Scientific Community	SDG #3
3	10th World Congress on Mechanical, Chemical, and Material Engineering " Experimental Investigation into Quasi-Static Crushing of CFRP Composite Cylindrical Tubes after Thermal Aging"	<b>Tamer Sebaey</b>	Scientific Community	SDG #3
4	3rd International Conference on Smart and Sustainable Developments in Materials, Manufacturing, and Energy Engineering (SME-2021)	<b>Abdul Aabid</b>	Session Chair	SDG #3
5	Fluid Dynamics and Materials Processing	<b>Abdul Aabid</b>	Editorial Board	SDG #3
6	Journal of Modern Mechanical Engineering and Technology	<b>Abdul Aabid</b>	Editorial Board	SDG #3
7	Advances in Civil Engineering-Hindawi	<b>Musa Adamu</b>	Editorial Board	SDG #11

### 4) Future Plans for 2021/2022 Academic Year

No.	Event	Organizer	Audience	Relevance to SDG #
1	Sustainable Bridge Design Contest	<b>Dr. Ezzat, Dr. Yasser, Dr. Musa, and Eng. Omar Shabir</b>	PSU Students	SDG #11
2	Alumni Get together	<b>Engr. Shabir Hussain</b>	PSU Alumni	SDG #17