

Abraiz Khattak



Assistant Professor, [Department of Electrical Power Engineering](#)
Principal Investigator/Technical Lead, [High Voltage Laboratory](#)
Head of Research Group, [High Voltage Testing and Insulation Diagnostic Engineering](#)
[United States-Pakistan Center for Advanced Studies in Energy \(USPCAS-E\)](#)
National University of Sciences and Technology (NUST), Islamabad, Pakistan
QS Ranked # 355 in general category and # 214 in Electrical and Electronic Engineering

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D.O.B: 01.01.1986

Marital Status: Married

Registered Engineer by Pakistan Engineering Council: ELECT/32112

Higher Education Commission Pakistan- Approved PhD Supervisor

◎ PERSONAL PROFILE

I am serving as assistant professor in the Department of Electrical Power Engineering of United States-Pakistan Center for Advanced Studies in Energy (USPCAS-E), National University of Sciences and Technology (NUST), Islamabad, Pakistan. I received PhD in Electrical Power Engineering from COMSATS Institute of Information Technology-Pakistan. My area of specialization is high voltage engineering.

In January 2018 I joined CECOS University of Information Technology and Emerging Sciences and taught different graduate subject and supervised students in their MS thesis. In April 2018, I joined the National University of Sciences and Technology (NUST), Islamabad, Pakistan as assistant professor and technical expert for development of high voltage engineering laboratory.

I have extensive experience of teaching at undergraduate and graduate levels and I am an active researcher in the field of high voltage engineering and energy systems. I have developed several novel dielectrics for high voltage insulation and have more than 50 publications including 30+ ISI indexed impact factor journal papers, and also authored a book on renewable energy systems. I am serving as an active reviewer for several renowned journals such as IEEE transactions on dielectrics and Electrical Insulators, IET Measurement Science and Technology, Electrical Engineering (Springer) , Turkish Journal of Electrical Engineering, Electric Power Components and Systems and Computer Sciences (TUBITAK) and Journal of Polymer Engineering.

I have been attending board of studies, board of faculties, industries academia advisory board and selection board in various universities and played important role in curriculum development for electrical power engineering.

I have supervised several students in Master of Electrical Engineering and also currently supervising PhD and MS students in the field of high voltage engineering and power systems. For several students' projects I have received funding from national platforms.

◎ EDUCATION

○ **Ph.D. Electrical Engineering (2013-2017)**

Specialization: High Voltage Engineering

Department of Electrical Engineering, COMSATS Institute of Information Technology (CIIT) – Pakistan

Thesis Title: Long Term Multistress Aging of High Voltage Nanocomposites

○ **Overview of PhD's Research work**

In this research work, nine different insulating samples of neat, nanocomposites and hybrid nano-microcomposites of Silicone Rubber (SiR), EPDM and epoxy with different loadings of nano and micro-silica (SiO₂) fillers were prepared according to the standard procedures. The nanocomposites and hybrid nano-microcomposites were energized with high voltage and aged with reference to the neat samples in the accelerated environment designed on the basis of

actual field conditions. The duration of this artificial Multistresszaging was kept 9000 hours (13.4 lab years). Leakage current (LC) measurement, STRI hydrophobicity classification method, Fourier Transform Infrared (FTIR) spectroscopy, visual inspection, Scanning Electron Microscopy (SEM) and statistical tools were used for condition assessment of these high voltage insulators.

This was a unique work of its own nature, which presented long term multi-stressed aging analysis of silica based diversified high voltage polymeric nanocomposite insulators for overhead HV transmission system. Almost ten years enhancement in service life of the developed insulators was obtained which is an ample contribution in the field of high voltage engineering and the work was published in several peer reviewed international journals. The results of this research work and final thesis were evaluated by following renowned international experts of high voltage engineering.

- i. Prof. Raji Sundararajan-Purdue University-USA
- ii. Prof. Sheeshakamal Jayaram-University of Waterloo-Canada. ([Details](#))

- o **M.S. Electrical (Power) Engineering (2011- 2013)**

1st Division, University of Engineering and Technology (UET), Peshawar-Pakistan

Thesis Title: Priority Based Utilization and Control of Renewable Energy in the Hybrid Domestic Power System.

- o **Abstract of MS Thesis**

In this project a hybrid power system (HPS) is modeled which can minimize consumer peak hours demand and cost of generation. Wind and solar energy resources are combined which feed into the existing power system to fulfill the consumer load demand, and minimize the use of electricity from the utility company which result in minimizing the consumer bills. In order to improve the system's reliability, backup generator is connected in the system and renewable energy resources are exerted on priority basis for cost effective operations, i.e. to consume the cheapest energy at top priority an algorithm is implemented that consumes renewable energy at precedence. For possible combination of energy sources and ease of governing, the demanded load is distributed in different portions. The whole power system is controlled with a single controller unit Furthermore, cost effective and reliability analysis is performed to evaluate the designed system's practicability.

- o **B.Sc. Electrical Engineering (2006-2010)**

1st Division, University of Engineering and Technology (UET), Peshawar-Pakistan

- o **F.Sc. Pre Engineering (2004 – 2005)**

1st Division B.I.S.E Mardan (Jinnah Memorial College Nowshera)

- o **SSC. Science (2001 – 2002)**

1st Division B.I.S.E. Peshawar. (G.H.S.S Jallozai-Nowshera)

- o **EXPERIENCE**

- o **Assistant Professor (April 2018-till date)**

Department of Electrical Power Engineering, United States-Pakistan Centre for Advanced Studies in Energy (USPCAS-E), National University of Sciences and Technology (NUST), H-12, Islamabad, Pakistan

USPCAS-E is a project funded by USAID in National University of Sciences and Technology with partner university of Arizona State University-USA. The main objective of this research center is to provide solutions to cope with energy crisis of Pakistan.

Main Responsibilities:

1. Technical Lead of High Voltage Laboratory, NUST
2. Head of Research group HIT-IDEN (<https://hitiden.com/>)
3. Supervision of MS/PhD Students in the power engineering
4. Teaching of courses 1. High Voltage Engineering 2. Special topics in dielectrics and electrical insulators 3. Power system operation control and optimization 4. Power Generation Transmission and Distribution 5.
5. Responsible for research and development in high voltage engineering.

- o **Assistant Professor (December 2017- April 2017)**

Department of Electrical Engineering; CECOS University of IT & Emerging Sciences -Pakistan

Main Responsibilities

1. Supervision of MS/PhD Students in the power engineering

2. Teaching to BS/MS/PhD students
 3. courses assigned
 - I. Power electronics II. Power generation, operation and control III. High voltage engineering
 4. Member Board of studies for evaluation of power engineering courses
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⊙ RESEARCH PUBLICATIONS

1. **Abraiz Khattak** & M. Amin. (2016). *Influence of stresses and fillers on the aging behavior of polymeric insulators. Rev. Adv. Mater. Sci*, 44, 194-205.
2. M. Amin, **Abraiz Khattak**, and Muhammad Ali. "Life Estimation and Investigation of Dielectric Strength of Multistressed High Voltage Epoxy Micro and Nanocomposites." *IET/IEEE Micro & Nano Letters*, 11(11), 765-768.
3. **Abraiz Khattak** & M. Amin, (2016). *Accelerated aging investigation of high voltage EPDM/silica composite insulators. Journal of Polymer Engineering*, 36 (2), 199-209.
4. Amin, M., **Abraiz Khattak**., & Ali, M. (2018). Accelerated aging investigation of silicone rubber/silica composites for coating of high-voltage insulators. *Electrical Engineering*, 100(1), 217-230.
5. **Abraiz Khattak** Iqbal, M., & Amin, M. (2017). Aging analysis of high voltage silicone rubber/silica nanocomposites under accelerated weathering conditions. *Science and Engineering of Composite Materials*, 24(5), 679-689
6. Ullah, N., Ali, M. A., Ahmad, R., & **Abraiz Khattak** (2017). Fractional order control of static series synchronous compensator with parametric uncertainty. *IET Generation, Transmission & Distribution*, 11(1), 289-302
7. Amin, M., Ali, M., & **Abraiz Khattak**. (2018). Fabrication, mechanical, thermal, and electrical characterization of epoxy/silica composites for high-voltage insulation. *Science and Engineering of Composite Materials*, 25(4), 753-759.'
8. **Abraiz Khattak**, Amin, M., & Iqbal, M. (2018). Long term accelerated aging investigation of an epoxy/silica nanocomposite for high voltage insulation. *Journal of Polymer Engineering*, 38(3), 263-269.
9. **Abraiz Khattak**., Amin, M, Iqbal, M., Abbas N. (2018). Life Estimation and Analysis of Dielectric Strength, Hydrocarbon Backbone and Oxidation of High Voltage Multistressed EPDM Composites. *Materials Research Express* 5(2), 025003.
10. Rashid, A., Amin, M., Ali, M., & **Abraiz Khattak**. (2018). Aging exploration of long term multistressed HTV-silicone rubber/silica/alumina composites for high voltage insulation. *Materials Research Express* 5(9), 095301.
11. **Abraiz Khattak**, Amin, M., Khan, A., & Imran, K. (2019). Life Estimation and Investigation of Dielectric Strength and Siloxane Backbone of High Voltage Silicone Rubber Composites under Accelerated Multistress Conditions. *Arabian Journal for Science and Engineering*, 44(8), 7149–7158
12. Rashid, A., Amin, M., Ali, M., **Abraiz Khattak** & Saleem, J. (2019). Fabrication, characterization and aging influence on characteristics of high temperature vulcanized silicone rubber/silica hybrid composites for high voltage insulation. *Materials Research Express*, 6(10), 105327.
13. **Abraiz Khattak** Imran, K., Ali, A., Khan, Z. S., Ulasayar, A., Amin, M., ... & Haq, A. U. (2020). Effects of Compression and Silica Addition on the Dielectric Properties of Epoxy Composites. *Arabian Journal for Science and Engineering*, 1-10.
14. **Abraiz Khattak** , Kashif Imran , Faiza , Asghar Ali , Abasin Ulasayar , Azhar Ul Haq , Muhammad Amin and Adam Khan Investigation of dielectric properties and methylene intactness under multiple environmental stresses for high voltage epoxy composites, *Materials Research Express*, July 2020

15. Faiza, **Abraiz Khattak.**, Rehman, A. U., Ali, A., Mahmood, A., Imran, K., Ulasyar, A & Khan, A. (2021). Multi-Stressed Nano and Micro-Silica/Silicone Rubber Composites with Improved Dielectric and High-Voltage Insulation Properties. *Polymers (Special issue) Multi-Functional Smart Dielectric Materials for High Voltage Insulation*13(9), 1400
16. Faiza, **Khattak, A.**, Butt, S. U., Imran, K., Ulasyar, A., Ali, A., Khan, Z. S., ... & Khan, A. (2021). Investigation of Hydrothermally Stressed Silicone Rubber/Silica Micro and Nanocomposite for the Coating High Voltage Insulation Applications. *Materials*, 14(13), 3567.
17. Butt, S. U., **Abraiz Khattak.**, Ali, A., Imran, K., Ullah, N., Alahmadi, A. A., & Khan, A. (2021). Investigation of epoxy composites for outdoor insulation under accelerated ultraviolet exposure. *Materials Research Express*, 8(8), 085303.
18. Raza, M. H., **Abraiz Khattak.**, Ali, A., Butt, S. U., Iqbal, B., Ulasyar, A.A. ... & Khan, A. (2021). Surface Recovery Investigation of Silicone Rubber Composites for Outdoor Electrical Insulation under Accelerated Temperature and Humidity. *Polymers*, 13(18), 3024.
19. Iqbal, B, **Abraiz Khattak**, Asghar Ali, Raza, M. H., N Ullah, Alahmadi A. A. Influence of Ramped Compression on the Dielectric Behavior of the High-Voltage Epoxy Composites, *Polymers*, 13(18), 3150.
20. Khan, A. N., Imran, K., Nadeem, M., Pal, A., **Abraiz Khattak**, Ullah, K., ... & Younis, M. S. (2021). Ensuring Reliable Operation of Electricity Grid by Placement of FACTS Devices for Developing Countries. *Energies*, 14(8), 2283
21. Ali, Mazhar, Rashid Wazir, Kashif Imran, Kafait Ullah, Abdul Kashif Janjua, Abasin Ulasyar, **Abraiz Khattak**, and Joseph M. Guerrero. "Techno-economic assessment and sustainability impact of hybrid energy systems in Gilgit-Baltistan, Pakistan." *Energy Reports* 7 (2021): 2546-2562
22. Munir, A., **Abraiz Khattak.**, Imran, K., Ulasyar, A., Haq, A. U., & Khan, A. (2021). Artificial neural network based simplified one day ahead forecasting of solar photovoltaic power generation. *Journal of Engineering Research.*,
23. Nawaz, R., Zada, L., **Abraiz Khattak**, Jibrán, M., & Khan, A. (2019). Optimum Solutions of Fractional Order Zakharov–Kuznetsov Equations. *Complexity*, 2019.
24. Shah, M., Khan, N., Imran, Z., Khan, M., **Abraiz Khattak**, Khan, A., & Ullah, N. (2019). Structural, optical and impedance spectroscopy study of thin film of polyaniline (PANI/ZnO) nanocomposite. *Materials Research Express*, 7(1), 015314.
25. Nadeem, M., Imran, K., **Abraiz Khattak** Ulasyar, A., Pal, A., Zeb, M. Z., ... & Padhee, M. (2020). Optimal Placement, Sizing and Coordination of FACTS Devices in Transmission Network Using Whale Optimization Algorithm. *Energies*, 13(3), 753.
26. Nawaz, R., Hussain, Z., **Abraiz Khattak** & Khan, A. (2020). Extension of Optimal Homotopy Asymptotic Method with Use of Daftardar–Jeffery Polynomials to Coupled Nonlinear-Korteweg-De-Vries System. *Complexity*, 2020.
27. Nawaz, R., **Abraiz Khattak** Akbar, M., Ahsan, S., Shah, Z., & Khan, A. (2020). Solution of fractional-order integro-differential equations using optimal homotopy asymptotic method. *Journal of Thermal Analysis and Calorimetry*, 1-13.
28. Zeb, M. Z., Imran, K., **Abraiz Khattak**, Janjua, A. K., Pal, A., Nadeem, M., ... & Khan, S. (2020). Optimal Placement of Electric Vehicle Charging Stations in the Active Distribution Network. *IEEE Access*, 8, 68124-68134.
29. Imran, K., Zhang, J., Pal, A., **Abraiz Khattak**, Ullah, K., & Baig, S. M. (2020). Bilateral negotiations for electricity market by adaptive agent-tracking strategy. *Electric Power Systems Research*, 186, 106390.

30. Imran, K., Ullah, K., **Abraiz Khattak**, Zhang, J., Pal, A., Rafique, M. N., & Baig, S. M. (2020). Matchmaking model for bilateral trading decisions of load serving entity. *Electric Power Systems Research*, 183, 106281.
31. Ul Mehmood, M., Ulasayar, A., **Abraiz Khattak**, Imran, K., Sheh Zad, H., & Nisar, S. (2020). Cloud Based IoT Solution for Fault Detection and Localization in Power Distribution Systems. *Energies*, 13(11), 2686.
32. Amin, M., **Abraiz Khattak**, & Ali, M. (2018). Influence of Silica (SiO₂) "Loading on the Thermal and Swelling Properties of Hydrogenated-Nitrile-Butadiene-Rubber/Silica (HNBR/Silica) Composites". *Open Engineering*, 8(1), 205-212.
33. N. Ullah, Asghar, M., **Abraiz Khattak**, & Rafiq, M. M. (2017). *Comparison of integer and fractional order robust controllers for DC/DC converter feeding constant power load in a DC microgrid. Sustainable Energy, Grids and Networks*, 12, 1-9. Elsevier
34. Ali, W., Ulasayar, A., Mehmood, M. U., **Abraiz Khattak**, Imran, K., Zad, H. S., & Nisar, S. (2021). Hierarchical Control of Microgrid Using IoT and Machine Learning Based Islanding Detection. *IEEE Access*, 9, 103019-103031.
35. H.A. Hamdani , A. Khattak , **Abraiz Khattak** Application of PWM Voltage Source Rectifier In Switched Reluctance Motor Drives, *International Journal of Engineering & Science Research*_October 2014, Vol-4, Issue-10,Pp: 772-780.
36. **Abraiz Khattak** and Muhammad Naeem Arbab, *Model and Design for the Control of Hybrid Domestic Power System, City University Research Journal (CURJ)*, Vol. 02, Issue 02, July-2012 pp. 147-154.
37. Hidayatullah Khan, Fazal Muhammad and **Abraiz Khattak**; *Design and Implementation of Power Generation Utilizing Human as a Source, City University Research Journal (CURJ)*, Vol. 02, Issue 02, Pp. 116-121 July-2012.
38. H. A. Hamdani and **Abraiz Khattak** *Multi Pulse Voltage Source Rectifier- Tool for THD Reduction in Input Current of Switched Reluctance Motor Drives, International Conference on Emerging Trends In Engineering, Management & Sciences*, 28 December, 2014 Islamabad.
39. **Abraiz Khattak**, Muhammad Zakariya Khan, Naseem Ullah and Adam Khan³, *Implementation and analysis of demand side management techniques for industrial loads , 2nd International Conference on Emerging Trends in Engineering, Management and Sciences (ICETEMS), 2016*
40. I.U. Khalil, **Abraiz Khattak** and M.U. Ahsan, *A Solar PV Adoption at Home (A case of Peshawar-Pakistan), IEEE international conference of Recent Advances in Electrical Engineering-2017 (RAEE 17)-Pakistan Institute of Applied Sciences and Engineering-Islamabad Pakistan (PIEAS). 24-26 October-2017*
41. Adeel Khan, **Abraiz Khattak**, Abasin Ulasayar, Kashif Imran and Asim Munir, Investigation of Archimedean Screw Turbine for optimal power output by varying number of blades, *Proc. of the 1st International Conference on Electrical, Communication and Computer Engineering (ICECCE) 24-25 July 2019, Swat, Pakistan*
42. Asim Munir, **Abraiz Khattak**, Abasin Ulasayar, Kashif Imran and Adeel Khan, *Solar PV Generation Forecast Model Based on the*
43. Munir, M. A., Khattak, A., Imran, K., Ulasayar, A., & Khan, A. (2019, July). Solar PV Generation Forecast Model Based on the Most Effective Weather Parameters. In *2019 International Conference on Electrical, Communication, and Computer Engineering (ICECCE)* (pp. 1-5). IEEE.
44. Amin, M., Mahmood, A., & Khattak, A. (2020, January).
44. Accelerated Multistress Aging and Life Estimation of Polymeric Insulators. In *2020 17th International Bhurban Conference on Applied Sciences and Technology (IBCAST)* (pp. 55-61). IEEE.
45. Ullah, M., Ulasayar, A., Zad, H. S., & Khattak, A. (2019, December). Design of Linear Quadratic Regulator Controller for Sepic Converter. In *2019 15th International Conference on Emerging Technologies (ICET)* (pp. 1-6). IEEE
46. Mehmood, M. U., Ali, W., Ulasayar, A., Zad, H. S., Khattak, A., & Imran, K. (2019, July). A Low Cost Internet of Things (LCIoT) Based System for Monitoring and Control of UPS System using Node-Red, CloudMQTT and IBM

Bluemix. In *2019 International Conference on Electrical, Communication, and Computer Engineering (ICECCE)* (pp. 1-5). IEEE.

47. Akbar, M. N., Umar, M. F., Ulasayar, A., Zad, H. S., **Abraiz Khattak**, & Kazmi, S. M. R. (2019, July). Low Cost Design of a Motor Characterization Test Bed for Control System Validation. In *2019 International Conference on Electrical, Communication, and Computer Engineering (ICECCE)* (pp. 1-6). IEEE.
48. Qaisar, M. H., **Abraiz Khattak**, Bilal, M., Imran, K., & Ulasayar, A. (2021, March). Electrical Energy Management in Spinning Area of Textile Industry. In *2021 4th International Conference on Energy Conservation and Efficiency (ICECE)* (pp. 1-6). IEEE
49. Asghar, T., Imran, K., **Abraiz Khattak**, Ulasayar, A., & Naveed, A. (2021, March). Economic and Performance Analysis of PV System and Grid Supply for High Rise Building and Luxury Villa in Pakistan. In *2021 4th International Conference on Energy Conservation and Efficiency (ICECE)* (pp. 1-6). IEEE.
50. Ashfaq, Q., Ulasayar, A., Zad, H. S., **Abraiz Khattak**, & Imran, K. (2020, November). Hour-Ahead Global Horizontal Irradiance Forecasting Using Long Short Term Memory Network. In *2020 IEEE 23rd International Multitopic Conference (INMIC)* (pp. 1-6). IEEE.

🕒 RESEARCHER'S METRICS

Author's Total Impact Factor= **101.34**

H-Index=**12**

i10 index=**16**

Total Publications= **59**

Peer Reviewed Journals=**39**

Impact Factor Journals= **36**

Only Scopus Indexed=**3**

Others = **20**

R^G (Researchgate): <https://www.researchgate.net/profile/Abraiz-Khattak>

Google Scholar: <https://scholar.google.com/citations?user=yLgtZzwAAAAJ&hl=en&oi=ao>

📖 BOOK (s)

Abraiz Khattak, N. Ullah and N. Abbas, *Stand-alone and Grid-Connected Small Scale Renewable Energy Systems-Introduction and Implementation*, ISBN 978-3-659-62625-8, Publication of Lambert, Germany

🏗️ PROJECT (s)

1. Development of Novel Nano-dielectrics for High Voltage and insulation Applications

Role: Principal Investigator

Status: In-progress

Funding Agency: HEC-Pakistan

2. Development of Accelerated Weathering Standard and testing facility of 11 kV insulators for Pakistan

Role: Principal Investigator

Status: Completed

Funding Agency: HEC-Pakistan

3. Development of Accelerated Ultraviolet Standard and testing facility of 11 kV insulators for Pakistan

Role: Principal Investigator

Status: Completed

Funding Agency: HEC-Pakistan

4. Energy Management and Conservation

Role: Principal Investigator

Status: Completed

Funding Agency: Crescent Textile Mills-Pakistan

5. Leakage current measurement for high voltage outdoor insulators

Role: Principal Investigator

© SUPERVISIONS

○ **PhD** (In progress)

1. **Faiza Ijaz:** Fabrication, Characterization and Aging Investigation of Polymer Nanocomposites for Insulation and Dielectric Applications
2. **Muhammad Haroon**
Main Area: Dielectric Properties of Novel Nano-dielectrics
3. **Aqeel ur Rehman**
Main Area: Life enhancement of Novel Modern Insulators

○ **MS Electrical Engineering (Theses)**

1. **Ihsanullah Khan** An Innovative Design and Implementation of Very Low Energy Buildings
2. **Mubashir Javed** Power Transmission Quality Enhancement and Robust Power System Stabilization Using Static VAR Compensators
3. **Bahadar Shah** Feasibility and Analysis for deployment of DC Micro Grid in Small Scale power system
4. **Sham-ur-Rehman** Design and Analysis of Improved Droop Control Based Dc Micro-Grid
5. **Mujeeb ur rehman** Development and Investigation of Control Strategy for Buck Boost Converter
6. **Shah Hasaan** Design And Analysis of Control Strategy For Single Stage And Two Stage Grid Tied PV Inverter
7. **Waqar Ahmed** Analysis of Back-Stepping Control Based L & Amp; LCL Filters For Two Stage Grid Connected PV Inverters.
8. **Adnan Aslam** Design and Investigation of Converters for HVDC Based On-Grid PV System
9. **Asim Munir** Simulation & Analysis of a Simplified Solar Energy Forecast Model Based on Weather Parameters
10. **Adeel Khan** Analytical study of Archimedean screw turbine by varying numbers of blades and numbers of helix turns for Shahdara, Islamabad
11. **Aqeel ur Rehman** Development and Implementation of Accelerated Weathering Standard and Facility for High Voltage Insulators
12. **Hafiz Muhammad Saad** Simplification of weather parameters for solar PV power forecast model using machine learning algorithms
13. **Syed Tahir Shah** Operation, Control and Analysis of Hybrid Multiterminal HVDC System Using Different Control Strategies Under Abnormal Conditions
14. **Safi Ullah Butt** Degradation analysis and Ultraviolet radiation effect on epoxy insulators
15. **M Hassan Raza** Effect of Temperature and compression on dielectric properties of high voltage silicone Rubber composites
16. **Muhammad Bilal Iqbal** Effect of Temperature and compression on dielectric properties of high voltage epoxy composites
17. **Muhammad Safian Qureshi** Shielding and Noise Analysis of High Voltage Laboratory
18. **Hafiz Muhammad Bilal** Earthing Analysis of High Voltage Laboratory

○ **BS Electrical Engineering (Selected Final Year Projects)**

1. Monitoring and Analyzing System for of Power System's Parameters (**Funded by ICT – RnD-Pakistan Funded**)
 2. Multi-Controls Mines' Detecting and Marking Robot (**Funded by ICT – RnD-Pakistan Funded**)
 3. Implementation of accelerated aging chamber for Investigation of High Voltage Insulators ((**Funded by ICT – RnD- Pakistan Funded**))
 4. Dual Axis Solar Tracking System
 5. Design and Analysis of Solar Photovoltaic System
 6. Implementation of Efficient Energy systems for domestic use
 7. Priority Based Cost Effective Utilization and Control of Multi Energy sources
 8. Reliable Power System with Increased Protection of Distribution Transformers
 9. Implementation of Intelligent Renewable Energy system using net meter.
 10. Design and Investigation of Solar Photovoltaic DC micro grid
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⊙ Certifications

1. High voltage expert and operator training on range of high voltage equipment_by **Haefeley AG Switzerland**
 2. Technical expert for designing, development and operation of high voltage laboratories by **RASTEK-TECHNOLOGIES, Pakistan**
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⊙ MEMBERSHIPS AND PARTICIPATIONS

1. As expert in selection board of faculty for department of Electrical Engineering Power Stream (Assistant Professors and Lecturers), Air University, Islamabad, Pakistan
 2. Member Faculty board of studies US-Pakistan Centre of Advanced Studies in Energy-National University Sciences and Technology (NUST)-Pakistan
 3. Member Board of Studies and Faculty of Department of Electrical Engineering CECOS University of IT and Emerging Sciences-Peshawar-Pakistan
 4. Member Board of Studies and Faculty for Department of Electrical Engineering City University of Science and IT- Peshawar-Pakistan
 5. International Research Expert for Department of Management of Science and Technology Ton Duc Thang University Viet Nam
 6. Member Organizing Committee International Conference on Sustainable Energy in Pakistan (NUST-Islamabad-Pakistan)
 7. Member (Electrical Power) Industrial Advisory Board- University of Engineering and Technology-Peshawar-Pakistan
 8. As expert/presenter on recent trends in high voltage engineering in Summer School of Energy US-Pakistan Centre of Advanced Studies in Energy-National University Sciences and Technology (NUST) Pakistan
 9. Five days placement as research expert for industry academia research collaboration by NUST in Crescent Textile Mills, Faisalabad-Pakistan
 10. As external evaluator of PhD scholar at NUCES-FAST (University), Islamabad-Pakistan
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