Format for Detailed Profile for Faculty Members – For the purpose of Website Update

1. Name of the Faculty Member: **Dr. Maneesh Kumar**
2. Designation: **Assistant Professor (Gr-II)**
3. Education:
   B. Tech (Electrical Engineering) (G.B. Pant University of Agriculture and Technology, Pantnagar),
   M.E. (Electrical Engineering) (P.E.C. University, Chandigarh),
   Ph.D. (Electrical Engineering) (Indian Institute of Technology, Roorkee)
4. Areas of Interest:
   Microgrids, Optimization, Robust Control, AI-ML Applications in Power Systems, Renewable Energy Systems, Hybrid EVs
5. Experience including post-doc (if any):
   a. Lecturer (2009-2011, DIT Dehradun, Uttarakhand),
   b. Assistant Professor (2021-2022, YCCE Nagpur, Maharashtra),
   c. Post-doc (2022-2025, Indian Institute of Technology Roorkee).
6. Awards / Distinctions:
   a. MHRD scholarships during the Master's and Doctorate.
   b. Best Paper award in the IEEE International Conference (EPREC-24) held at NIT Jamshedpur in 2024
   c. Best Poster award in the IEEE International Conference (SEFET-24) held at Hyderabad in 2024
7. Membership of professional bodies:
   a. **Senior Member IEEE (SMIEEE),**
   b. **Life Member ISTE (LMISTE),**
   c. **Member (IE)**
8. Courses Taught / being taught (last 2 years only): **Custom Power Devices, Analog and Digital Electronics, Machine learning and data analytics**
9. PhD Supervised / Under Supervision (including details of the scholars): **NA**
10. M.Tech. Dissertation Supervised (Give number only): **NA**

11. List of Publications (Journal Publications in descending order)

[1] **Maneesh Kumar,** et. al. An adaptive control strategy for DC–DC buck converter for a small-scale distributed green hydrogen production unit using SPV-battery-based off-grid system, Renewable Energy, **Elsevier,** Volume 255, (2025), 123697

[2] **Maneesh Kumar**, et. al. Optimal sizing of solar photovoltaic water pumping systems by synergizing irrigation patterns and static heads: A comprehensive study in the Indian context, Sustainable Energy Technologies and Assessments, **Elsevier**, Volume 77, (2025), 104341, https://doi.org/10.1016/j.seta.2025.104341.

[3] Prajapati, A.K., Sen, S., **Kumar, M.** et al. Order Reduction of Real-Time Electromechanical Systems by Using a New Model Order Reduction Method and Controller Design. Circuits Syst Signal Process, **Springer,** (2024). https://doi.org/10.1007/s00034-024-02878-w

[4] Sachidananda Sen, **Maneesh Kumar**, Basetti Vedik, et.al. Adaptive-DMPC based energy management and pre-installation techno-economic analysis of a grid-tied cyber-physical community microgrid, Chaos, Solitons & Fractals, **Elsevier**, Volume 187, (2024), 115445, https://doi.org/10.1016/j.chaos.2024.115445.

[5] **Maneesh Kumar**, Sachidananda Sen, J. Ajayan, A comprehensive techno-economic analysis for hydrogen fuel-cell supported HEVs using predictive control approach, International Journal of Hydrogen Energy, **Elsevier,** Volume 83, (2024), Pages 396-409, https://doi.org/10.1016/j.ijhydene.2024.08.130.

[6] **Maneesh Kumar** et al. "An Adaptive Fuzzy Controller-Based Distributed Voltage Control Strategy for a Remote Microgrid System with Solar Energy and Battery Support" **IEEE Transactions of Industry Applications,** Vol. 60, Issue 3, (2024) doi:10.1109/TIA.2024.3350577

[7] S. Sen and **Maneesh Kumar,** "Distributed-MPC Type Optimal EMS for Renewables and EVs Based Grid-Connected Building Integrated Microgrid," in **IEEE Transactions on Industry Applications**, vol. 60, issue 2, pp. 2390 – 2408, (2024), doi: 10.1109/TIA.2023.3332055.

[8] **Maneesh Kumar**, and Barjeev Tyagi, "Machine learning-based Stochastic Optimal Energy Management Framework (OEMF) for a Renewable Energy Assisted Isolated Microgrid System," **Energy Sources, Part B: Economics, Planning, and Policy, Taylor and Francis**, doi: 10.1080/15567249.2023.2294869, 19 (1) pp-1556-7249, (2024)

[9] **Maneesh Kumar**, Sachidananda Sen, et al. "Emission-Averse Techno-Economical Study for an Isolated Microgrid System with Solar Energy and Battery Storage," Electrical Engineering Journal**, Springer Nature**, 105, pages 1883–1896 (2023)

[10] S. Diwania, **Maneesh Kumar**, et al. "Machine Learning based Thermo-Electrical Performance Improvement of Nanofluid Cooled Photovoltaic-Thermal (PVT) System," **Energy and Environment,** https://doi.org/10.1177/0958305X221146947, Dec. 2022

[11] S. Diwania, R. Kumar, **Maneesh Kumar**, Varun Gupta, Theyab R Alsenani, "Performance Enrichment of Hybrid Photovoltaic Thermal Collector with different Nano-fluids," **Energy and Environment**, https://doi.org/10.1177/0958305X221093459, April 2022

[12] **Maneesh Kumar** and Barjeev Tyagi, "A Robust Adaptive Decentralized Inverter Voltage Control approach for Solar PV and Storage based Islanded Microgrid", **IEEE Transactions on Industry Applications,** Volume: 57, Issue: 5, pp 5356 - 5371, 2021

[13] **Maneesh Kumar** and Barjeev Tyagi, "An Optimal Multivariable Constrained Nonlinear (MVCNL) Stochastic Microgrid Planning and Operation Problem with Renewable Penetration", **IEEE Systems Journal**, Volume: 14, Issue: 3, pp 4143 – 4154, 2020

[14] **Maneesh Kumar** and Barjeev Tyagi, "Multi-variable Constrained Nonlinear Optimal Planning and Operation Problem for Isolated Microgrids with Stochasticity in Wind, Solar and Load Demand Data", **IET Generation Transmission & Distribution,** Volume: 14, Issue: 11, **pp** 2181-2190, 2020

[15] **Maneesh Kumar** and Barjeev Tyagi, "Optimal Energy Management and Sizing of a Community Smart Microgrid Using GA with Demand Side Management and Load Uncertainty", **ECTI Transactions on Computer and Information Technology**, Volume. 15, no. 2, pp. 186 - 197, Apr. 2021

[16] **Maneesh Kumar** and Raminder Kaur, "An Analytical Approach for transmission expansion planning with generation variations," **Transactions on Environment and Electrical Engineering**, ISSN 2450-5730, Volume. 2, no. 2, pg. 72-79, 2017

12. List of Publications (Conference / Technical Reports in descending order)

(International conferences)

[1] S. Sen, **M. Kumar**, B. Vedik and C. K. Shiva, "Recent Advances in Battery Management System for Li-Ion Type EVs with Predictive Control and FPGA," **IEEE International Conference (SSDEE), Dhanbad, India, 2025**, pp. 1-6, doi: 10.1109/SSDEE64538.2025.10967729.

[2] H. Sabhadia, S. Sen, **M. Kumar** and C. K. Shiva, "Centralized-Decentralized Secondary Controller for Standalone PV-Battery Unit Type Microgrid," **IEEE International Conference (SSDEE), Dhanbad, India, 2025**, pp. 1-6, doi: 10.1109/SSDEE64538.2025.10967706.

[3] H. Sabhadia, S. Sen and **M. Kumar,** "Centralized-Decentralized Control Scheme for Power Sharing in Multiple PV-Battery System," **IEEE International Conference (SSDEE), Dhanbad, India, 2025,** pp. 1-6, doi: 10.1109/SSDEE64538.2025.10968376.

[4] S. Sen, **M. Kumar,** B. Vedik and C. K. Shiva, "Planning and Analysis of Possible Land Utilization Patterns for Food-Energy Park With Renewables," **IEEE International Conference (SSDEE), Dhanbad, India, 2025,** pp. 1-6, doi: 10.1109/SSDEE64538.2025.10968874.

[5] **M. Kumar**, S. Sen, V. Basetti and S. Diwania, "A Comprehensive Hydrogen Production Rate Control for a PEM Electrolyzer Load Using PID Controller Supplied from a Small-scale Microgrid," **IEEE International Conference (SSDEE), Dhanbad, India, 2025,** pp. 1-6, doi: 10.1109/SSDEE64538.2025.10968280.

[6] H. Sabhadia, S. Sen, **M. Kumar** and C. K. Shiva, "Power Sharing in Multiple PV-Battery Based MG System by Considering Component Isolation," **IEEE International Conference (SSDEE), Dhanbad, India, 2025,** pp. 1-6, doi: 10.1109/SSDEE64538.2025.10968824.

[7] **Maneesh Kumar**, Sachidananda Sen, et al. "A Robust Performance Analysis of an Adaptive PID Controller used for a Solar PV-battery Powered Off-grid Microgrid for Irrigation Purposes" **IEEE Int. Conf. (SEFET), 31 July - 03 August, Hyderabad, 2024**

[8] Sachidananda Sen, **Maneesh Kumar**, et al. "Pre-Installation Techno-Economic Feasibility Studies of a Food-Energy Park as a Community MG" **IEEE Int. Conf. (SEFET), 31 July - 03 August, Hyderabad, 2024**

[9] **Maneesh Kumar,** Sachidananda Sen, et al. "A Comprehensive Power Management Approach for Hydrogen Fuel-cell-Based Hybrid EVs Using PID Controller" **IEEE Int. Conf. (GlobConHT), Maldives, March 2023**

[10] Sachidananda Sen, **Maneesh Kumar**, et. al. "Predictive Controller Based EMS and Techno-Economics of an Electrical-Thermal Community MG" **IEEE Int. Conf. (GlobConHT), Maldives, March 2023**

[11] **Maneesh Kumar,** Sachidananda Sen, et al. "Optimal Planning for Building Integrated Microgrid System (BIMGS) for Economic Feasibility with Renewable Energy Support" **IEEE Int. Conf. PIICON 2022**

[12] Sachidanand Sen**, Maneesh Kumar,** et al. "A Techno-Economic Feasibility Studies of an Off-Grid Community MG Using Predictive Control" **IEEE Int. Conf. PIICON 2022**

[13] **Maneesh Kumar** and Sachidananda Sen, "A Robust Performance Analysis of a Solar PV-battery based Islanded Microgrid Inverter Output Voltage Control using Dual-loop PID Controller", **IEEE, IAS Int. Conf.**, **20-22 May**, **2022,** Arad**,** Romania.

[14] Sachidananda Sen and **Maneesh Kumar**, "MPC Based Energy Management System for Grid-Connected Smart Building with EVs", **IEEE, IAS Int. Conf.**, **20-22 May, 2022,** Arad**,** Romania.

[15] S Diwania, D Rawat, **Maneesh Kumar**, GS Dua, "Hybrid GSA-CS assisted performance evaluation of single-channel PVT air collector", **IEEE Int. Conf. (SRC'2021)**, Bahrain

[16] **Maneesh Kumar** and Barjeev Tyagi, "Capital Cost-based Planning and Optimal Sizing of a Small Community Smart Microgrid", **IEEE Int. conf. (KST2020),** Chonburi, Thailand, 29 Jan-1 Feb 2020

[17] **Maneesh Kumar** and Barjeev Tyagi, "Design of A Model Reference Adaptive Controller (MRAC) for DC-DC Boost Converter for Variations in Solar Output Using modified MIT Rule

in an Islanded Microgrid," **IEEE Int. conf. IAS PESGRE**, 2-4 January 2020, Cochin, Kerala, India

[18] **Maneesh Kumar** and Barjeev Tyagi, "Design of a PID controller for Solar Inverter connected in an Islanded Microgrid," **IEEE Int. Conf. (ICAIA2019)**, Roorkee, India 20-21 Nov. 2019

[19] **Maneesh Kumar** and Barjeev Tyagi, "Long Term Microgrid Planning based on LCC analysis for different system Configurations," **IEEE Int. conf. (ICCPCCT),** Kerala, India 23-24 March 2018

[20] **Maneesh kumar** and Barjeev Tyagi, "A Small Scale Microgrid Planning based on battery SOC for a Grid-connected Microgrid comprising of PV system", 14th **IEEE Int. conf. (INDICON),** 15-17 Dec.2017

[21] **Maneesh Kumar** and Raminder Kaur, "Transmission expansion planning with load variation under deregulated environment: An Analytical Approach", 14th **IEEE Int. conf. (INDICON),** 15-17 Dec.2017

[22] **Maneesh Kumar**, Raminder Kaur and Tarlochan Kaur, "An Analytical Approach for transmission expansion planning with generation variations," **IEEE ICEEE and IEEE ICPSE (EEEIC / I&CPS Europe), Italy**, July 2017

[23] **Maneesh kumar**, Barjeev Tyagi, "A State of Art Review of Microgrid Control and Integration Aspects", **IEEE 7th India Int. conf. on Power Electronics (IICPE)** Nov. 2016.

[24] **Maneesh Kumar**, Raminder Kaur, Tarlochan Kaur and Silpa Verma, "Optimal transmission expansion planning under deregulated environment: An analytical approach", **IEEE Int. conf. on Power Electronics, Intelligent Control and Energy Systems (ICPEICES),** 6-9June 2016.

[25] **Maneesh Kumar** and Raminder Kaur, "A study of Power transmission constraints and planning philosophy in Indian perspective" PSIMT 2015, International conference at **YMCA University Faridabad**, India, April 2015.

[26] **Maneesh Kumar** and Raminder Kaur, "Transmission Expansion planning in Indian context: A review" (RATEE2014) International conference at **NITTTR Chandigarh**, India, Dec 2014.

(National conferences)

[1] **Maneesh Kumar** and Barjeev Tyagi, "Optimal Microgrid Planning and Operation Problem Formulation under the Stochasticity of Renewable and Load Data: A Case Study of Roorkee Area ", **Uttarakhnand Science and Technology Congress, 22-24 June 2022**

[2] **Maneesh kumar** and Gagandeep Singh Dua, "Impact of Green Technology & its future aspects" **National Conference (RAPS 2014) at PEC Chandigarh, India July 2014.**

[3] **Maneesh kumar** and Sourav Diwania "Control of Renewable Energy and Smart Grid" **National Conference (RAPS 2014) at PEC Chandigarh, India, July 2014.**

13. Books Authored / Edited

Book Chapters

[1] "Performance of Modern Industrial Plants with Renewable Power Generation: A Comprehensive System Analysis", **IET Publishers (doi:10.1049/pbpo207g_ch1)**

[2] "Machine learning and predictive control based energy management system for smart buildings," **Elsevier Publishers (ISBN 9780323995030, Sept. 2022)**

[3] "Fundamentals of Renewable Energy Resources for Smart Cities," **CRC Press, Taylor and Francis (ISBN 9781032669786**)

[4] **"**Trends in energy storage devices incorporating lead-acid batteries and supercapacitors for smart grid applications**" CRC Press, Taylor and Francis, eBook ISBN9781003340539, 2023**

[5] **"**Wind Energy Harvesting and Involved Power Electronics Conversion Systems for Smart Grid Interfacing**", CRC Press, Taylor and Francis, eBook ISBN9781003340539, 2023**

[6] **"**Basics and policies of sustainable development.**" Elsevier Publishers, 2023**

[7] **"**Introduction to Hybrid Energy System**,"** https://doi.org/10.1016/B978-0-323-93940-9.00031-1, **Elsevier Publishers, 2023**

[8] "Pressurized gaseous hydrogen production", **CRC Press, Taylor and Francis, ISBN/GTIN978-1-03-246556-2, 2024**

14. Research / Industry Projects (provide details for each separately)

- "Development of solar powered decentralized fertilizer production cum-irrigation units," as **Research Associate-III**, **(IIT Roorkee) (Funded by: Department of Science and Technology, Govt. of India) (2023-2025)**
- "Machine learning-based Dynamic Climate Projections for Power System Planning Datasets," as **Postdoctoral Project Fellow (IIT Roorkee) (Funded by: University of Colorado Boulder, USA) (2022-2023)**

15. Consultancy Assignments Carried out

- Energy audit of Flex Food industry as a technical member, Dehradun, India (2018)
- Technical and financial vetting of Yamuna Expressway and Industrial Development Authority (YEIDA) as a technical member, Greater Noida, India (2019)

16. Patents Published / Granted

Published (Utility patent)

[1] AN ADAPTIVE CONTROLLER FOR AN OFF-GRID SOLAR-POWERED ELECTROLYZER AND MOTOR-DRIVEN LOADS (Application no. 202511035491)

[2] RENEWABLE ENERGY DRIVEN AQUAPONICS FARMING SYSTEM, (Application no. 202541037455)

[3] SUSTAINABLE PEA PRESERVATION DEVICE (Application no. 202541038245)

[4] WASTE PROCESSING AND BIOGAS PRODUCTION DEVICE (Application no. 202541038708)

Design Registration (Published)

[1] "Hybrid Energy Powered Vehicle" (Application no. 396845-001)
[2] "Maximum Power Point Tracking (MPPT) based testing device for Photovoltaic Cell", (Design no. 6292793)
[3] "Hybrid Photovoltaic-thermal (HPVT) System with V-Groove Absorber", (Application no. 364184-001)
[4] "UVC-based Currency Sterilization Machine", (Application no. 363175-001)
[5] "Sheet and Tube-Based Hybrid Photovoltaic Thermal System", (Application no. 367354-001)
[6] "Curved Groove Absorber-based PVT System with Tracking Mechanism", (Application no. 375386-001)

17. Journal/Conference Reviewer/Editorial Assignments

Reviewer/Editor Service

[1] Reviewer of IEEE Transactions on Sustainable Energy
[2] Reviewer of IEEE Transactions on Smart Grids
[3] Reviewer of IEEE Transactions on Industrial Electronics
[4] Reviewer of IET Renewable Power Generation Journal
[5] Reviewer of IEEE Systems Journal
[6] Reviewer of the International Journal of Hydrogen Energy (Elsevier)
[7] Reviewer of Energy Journal (Elsevier)
[8] Reviewer of IEEE Canadian Journal of Electrical and Computer Engineering
[9] Reviewer of International Journal of Power Electronics and Drive Systems (SCOPUS/ SJR Q2)
[10] Invited reviewer for IEEE International conf. DASA' 2021, 2022, and 2023 Bahrain.
[11] Review Editor of Smart Grids Section of Frontier in Energy Research Journal, Switzerland from December 2021.
[12] Editorial board member of the Scientific Reports Journal (SCI, IF: 3.8) published by Springer Nature from October 2024.

18. Departmental Duties (last 2 years): **NA**
19. Expert Lectures Delivered:
    a. Distinguished speaker at the One Week Industry Oriented International Online Faculty Development Program on, "Next-Gen Sustainability Innovations: Pioneering Electric Vehicles and Renewable Energy Grid Integration", organized by the Centre for Emerging Energy Technologies from 29/07/2024 to 02/08/2024 at S.R. University, Telangana.

b. Expert talk on "Optimal Planning, Operation and Control of Isolated Microgrids" in the Five-Day Faculty Development Program on “Advancing Power Grid Operations: Integrating Renewable Sources and EVs at scale” organized by the Centre for Emerging Energy Technologies from 20/05/2024 to 24/05/2024, at S.R. University, Telangana.
c. Expert lecture in a value-added course titled "An Introduction to Smart Cities Concept", held between 1 April 2022 and 25 April 2022, organized by the Department of Electrical Engineering, YCCE, Nagpur, Maharashtra.
d. Technical session chair, ICASTM International conference, at S.B. Jain Institute of Technology, Management and Research, Nagpur (India), 23rd Dec. 2021

20. STTP/STC/Workshop Organized
    a. Organized a 30 hrs. value-added course on the topic “An Introduction to Smart Cities Concept”, between 1 April to 25 April 2022 at YCCE, Nagpur, Maharashtra.
21. Conference Organized: **N.A**
22. Outreach Activities (if any): **N.A**
23. Lab Developed: Assistance in Renewable Grid Integration lab. development at the Hydro and Renewable Energy Department, IIT Roorkee
24. Any Other information
    Certifications:
    - Advanced Certification in Power Distribution Management by IGNOU, New Delhi, and the Ministry of Power, Govt of India
    - Solar Chartered Engineer by Solar Energy Society of India (SESI)