

**Department of Electrical and Electronic Engineering
Bangladesh University of Engineering and Technology**

UG Tentative Thesis/Project Title, January 2026

1. Dr. Md. Saifur Rahman

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	IoT Signal Transmission and Reception (Requirement: Strong knowledge on MATLAB and Simulation Analysis, Computing FFT & Convolution experience is also Needed.)	CSP
2	Design and Implementation of a Charging Station for Electric Vehicles (Requirement: Basic Concepts of Battery Chargers and Charge Controllers are required, Strong Hardware & Electronic Design Experience Needed)	Power
3	Quantum Communication (Requirement: Must have prior knowledge on Quantum Communication related Mathematics and MATLAB and Python Codes.	CSP

2. Dr. Md. Shafiqul Islam

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	High Power GaN device modelling and simulation	Electronics
2	Performance Analysis and Design for TFET Sensors	Electronics
3	Heterojunction 2D Materials for Sensing Gas Leakage	Electronics

3. Dr. Md. Kamrul Hasan

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Ultrasound Strain Elastography Using Deep Learning Method	CSP
2	Segmentation and Classification of Medical Images Using Deep Learning Method	CSP
3	PPG-based Blood Sugar Determination Using Deep Learning Method	CSP
4	Low Dose CT Image Reconstruction Using Deep Learning Method	CSP
5	Ultrasound Shear-wave Elastography Using Deep Learning Method	CSP

4. Dr. Md. Aynal Haque

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Biomedical Signal Processing	CSP
2	Biomedical Image Processing	CSP

5. Dr. Sharif Mohammad Mominuzzaman

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Analysis of Chirality Dependent CNT based Nanodevice Optoelectronic Performance	Electronics and Photonics
2	Single-Electron Transistor (SET) Devices Incorporating Fullerene and DWCNT for high frequency Application	Electronics and Photonics
3	Stability Analysis of Nanomaterial incorporated Perovskite Solar Cells	Electronics and Photonics
4	Stability Analysis of Hybrid Renewable (PV, Wind, Nuclear) Integrated Power System	EEPS
5	Investigation of PV penetration in National Grid	EEPS
6	Development of Remote Monitoring System for Combined Cycle Power Plant	EEPS

6. Dr. Mohammad Jahangir Alam

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Electronics	Electronics
2	Electronics	Electronics
3	Electronics	Electronics

7. Dr. Md. Shah Alam

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	All-Solid Anti-resonant Fiber	CSP
2	Supercontinuum and Comb Generation in PCF/Nanowire	CSP
3	Metamaterial Absorber	EP
4	Plasmonic Sensors/Filters/Splitters	EP

8. Dr. Md. Ziaur Rahman Khan

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Design and Implementation of an Efficient Driver for motor Loads in a Standalone PV System	Power
2	Frequency Stability of Power System for Photovoltaic High-Penetration Ratio Grid-Connected Power Generation	Power
3	Hybrid floating solar photovoltaics-hydropower systems	Power
4	Optimal scheduling of electric vehicle charging operations	Power
5	Electric Vehicle Charging Station Placement	Power
6	Impact of Electric Vehicle Charging Station Load on Distribution Network	Power
7	Power Electronics Device Modeling	Power
8	Energy Storage System	Power

9. Dr. Mohammed Imamul Hassan Bhuiyan

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Sleep stage and disorder detection using deep learning	CSP
2	Medical Image Segmentation using deep learning	CSP
3	Image classification using deep learning	CSP
4	SOC and SOH prediction for battery management systems using deep learning	Power
5	Automatic modulation classification	CSP

10. Dr. Shaikh Anowarul Fattah

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Generative AI for Audio-Visual Reconstruction from Brain Signals (Neuro-Decoding)	CSP
2	Context-Aware Activity Recognition from Audio-Visual Signals for Smart Surveillance and Human-Robot Interaction	CSP
3	Vision-Language Model Assisted Context Generation for Image Segmentation and Classification	CSP
4.	Hybrid Quantum-Classical Machine Learning for Intelligent Systems	CSP
1.	Explainable and Contextual Short-Term Load Forecasting for Smart Grids	EEPS
2.	Digital Twin-Assisted Demand Forecasting and Failure Prediction in Multi-Source Industrial Energy Systems	EEPS

11. Dr. Md. Nasim Ahmed Dewan

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Design of an MPPT Solar Charge Controller	Power
2	Design of a BLDC Motor Controller	Power
3	Design of a power (~300 MVA) transformer	Power

12. Dr. S. M. Mahbubur Rahman

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Chain-of-Thought Reasoning for Audio-Visual Question Answering	CSP
2	Cognitive Impairment Assessment Using Audio-Visual Learning	CSP
3	Audio-Driven Avatar Animation Using PETL Audio-Visual Foundation Models	CSP
4	Physics-Informed Foundation Models for Energy System Digital Twins	EEPS
5	AI-Driven Digital Twins for Predictive Maintenance of Industrial Sewing Machine in RMG Sector	EEPS

6	LLM-Augmented Digital Twins	
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13. Dr. Muhammad Anisuzzaman Talukder

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Spin-polarized current assisted enhanced hydrogen energy	EP
2	AI-powered health prediction for electric vehicle batteries	EP
3	Quantum nanophotonics for biomedical imaging	EP
4	Development of lithium-ion battery digital twin for predictive maintenance	EP, Power
5	Photovoltaics-assisted efficient hydrogen generation	Power

14. Dr. Celia Shahnaz

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Generative AI, LLM and NLP for Speech Analysis	CSP
2	AI-assisted Breast Cancer and Biomedical abnormality Detection	CSP
3	Deep Learning for Deep Fake Detection	CSP
4	Versatile Audio-Video Learning network for Emotion Recognition	CSP
5	ComputerVision, IOT, AI and Robotics for Smart Automation and Assistive Technology for the Disabled	CSP
6.	AI driven Renewable Energy, Smart Grid, EV and Power Disturbances Classification	Power

For details, visit: <https://eee.buet.ac.bd/people/faculty/dcs>,
 Google Scholar Page: <https://scholar.google.com/citations?user=gwrHyr8AAAAJ&hl=en>

15. Dr. Mohammad Ariful Haque [2106100]

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Industrial anomaly detection using deep learning	CSP
2	AI-powered assistive devices and screening tools for children with special needs	CSP
3	Robot learning and UAV navigation	CSP
4	Speech and Natural language processing	CSP
5	AI-driven materials design (Student no. 2106100)	Electronics

16. Dr. Abdul Hasib Chowdhury

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Graph theory in power system analysis	Power
2	Graph theory in power system analysis	Power
3	Graph theory in power system analysis	Power

17. Dr. Farseem Mannan Mohammedy

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Mid-IR sensors and photodetectors	Electronics
2	Data driven Energy planning	Power
3	Energy transition scenarios	Power

18. Dr. Mohammad Faisal

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Next generation coherent optical transmission for datacenter interconnects	CSP
2	Multicore fiber (MCF) design	CSP
3	Ultrafast Optics	Electronics
4	Optical Biosensors	Electronics

19. Dr. Md. Forkan Uddin

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Multi-AP Coordination in WiFi-8	CSP
2	Industrial IoT Communications	CSP
3	UAV Assisted Integrated Sensing and Communication or 6G Cellular Communication	CSP
4	Scheduling for 6G Communications	CSP
5	Energy Storage/ Renewable Energy System Design and Operation for Smart Grid	Power

20. Dr. Lutfa Akter

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	5G and beyond	CSP
2	Radar and Satellite Communication	CSP
3	WiFi Signal-based Localization	CSP
4	Biomedical Signal Processing	CSP
5	Bangladesh Telecom Sector Landscape: Evolution, Challenges and Opportunities	CSP

21. Dr. Md. Kawsar Alam

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Characterization of Novel Materials	Electronics
2	Nano-electronic Device design and analysis	Electronics

3	Check for details: https://kawsaralam.buet.ac.bd/publication.html
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22. Dr. Md. Shamim Reza

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Power Systems	Power
2	Power Electronics	Power
3	Renewable Energy	Power

23. Dr. Apratim Roy

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	RF Design of HEMTs	Electronics
2	RF Design of Heterostructure Tunnel FETs for Biosensors	Electronics
3	Nanoelectronic devices and circuits for biomedical applications	Electronics

24. Dr. Mahbub Alam

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	2D materials/Topological Insulator/Quantum Materials based nanoFETs and post CMOS novel electronic devices	Electronics and Photonics
2	Contact engineering for 2D materials/ Energy harvesting for electronic wearables/Majorana fermions and devices/unconventional superconductivity	Electronics and Photonics
3	Ultra-low energy Neuromorphic, brain inspired learning and computing- algorithm and hardware	Electronics and Photonics
4	Effect of Electric Vehicles on the power system of Bangladesh/Effect of harmonics on industries and power system of Bangladesh	EEPS
5	Wireless charging of Electric Vehicles	EEPS

25. Dr. Md Zunaid Baten

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Spoof-surface plasmon polariton interconnects for chip-to-chip communication	Electronics and Photonics
2	Optical logic gates for photonic integrated circuits	Electronics and Photonics
3	Quantum emitters for quantum photonic applications	Electronics and Photonics

26. Dr. Ahmed Zubair

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Ab Initio Design and Characterization of Low-Dimensional Materials for Sustainable Energy Conversion and Storage	Electronics and Photonics
2	Engineering Valley Degree of Freedom in Low-Dimensional Materials for Next-Generation Electronic Devices	Electronics and Photonics
3	Metamaterials for Microbes Detection and Food Safety	Electronics and Photonics
4	Grid Integration Strategies for Enhancing the Performance and Reliability of Photovoltaic Systems	EEPS
5	Impact Assessment of High Renewable Energy Penetration on Power System Stability, Reliability, and Operation	EEPS

27. Dr. Hafiz Imtiaz

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Joint Wi-Fi CSI-Based Activity Recognition and Indoor Localization	CSP
2	Differentially Private Recommendation Algorithm based on Diffusion Model and Rényi Divergence	CSP
3	Privacy-preserving Semi-Supervised Algorithm for Power Grid Event Identification	EEPS

28. Dr. Shaikh Asif Mahmood

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Thermal properties in 2D materials	Electronics
2	Perovskite photoconductor for X-ray imaging	Electronics

29. Dr. Hamidur Rahman

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Hardware Security	Electronics
2	VLSI Testing	Electronics
3	Effect of Material and Geometry on Device	Electronics
4	Amplifier	Electronics
5	Power System Stability	Power
6	Renewable Energy	Power

30. Dr. Md. Asiful Islam [2106114, 2106058]

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Radar imaging	2106114, 2106058
2	Antenna design using inverse methods	CSP

3	AI in power systems	Power
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31. Dr. Sajid Muhaimin Choudhury

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Privacy-Preserving Edge-AI-Based Bangla Personal Assistant Build a domain-specific Bangla assistant that runs locally or semi-locally on an edge device. A small on device LLM, voice recognition, TTS software and complete hardware design and implementation, with optional motor control features. (group of 2 students recommended)	EP / CSP
2	Federated TinyML for Wearable PPG-IMU Health Monitoring with Personalized On-Device Inference Build or simulate a wearable node that classifies motion artifacts, stress/activity states, or physiological signal quality using PPG + IMU. Use federated learning or personalization without uploading raw data.	CSP
3	Design and FPGA Implementation of a RISC-V-Based Lightweight AI Accelerator for Tiny Transformer/CNN Inference at the Edge Extend a simple RISC-V soft processor with custom instructions or a tightly coupled accelerator for convolution, matrix-vector multiplication, or lightweight attention. Target tasks may include Bangla keyword spotting, sensor anomaly detection, or small vision inference.	EP
4	AI-Assisted Design of a Reconfigurable Metasurface for Switchable Quantum Emitter Emission	EP
5	Quantum Computing and Quantum Cryptography	CSP/EP/./
** Kindly note that I am exploring a new research direction. Please choose me as supervisor ONLY if you are interested in the given topics. Students will not be permitted to choose a thesis topic other than the above-mentioned topics. Please see my website for my previous research topics / interests at www.sajid.bd		

32. Yeasir Arafat

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Renewable Energy Integration & Grid Stability	Power
2	Smart Grids, Microgrids, & EV Integration	Power
3	Power System Protection & Resilience	Power
4	AI and Machine Learning in Power Systems	Power

33. Dr. Muhammad Abdullah Arafat

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	AI in Wearable Devices	Electronics
2	Flexible Electronics	Electronics

3	Under water wireless power transfer	Electronics
4	Gesture detection and prosthetic control using ML	CSP
5	Gesture detection and prosthetic control using ML	CSP
6	Grid Forming Inverter	Power

34. **Dr. Nadim Chowdhury**

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	GaN based CMOS Microprocessor Design	Electronics
2	Physics of Optically Gated GaN Transistor	Electronics
3	Power-Aware Logic Folding for Edge AI Devices	Electronics

35. **Dr. Orchi Hassan**

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Spintronics based Circuit Design and Analysis	Electronics
2	Energy-efficient AI/ML Hardware Accelerators	Electronics
3	Application of Spintronic Devices in Hardware Security	Electronics
4	Testing, and Reliability of MRAM Technologies	Electronics

36. **Dr. Ehsanur Rahman**

Sl. No.	Tentative Topic	Group (CSP/Electronics/Power)
1	Enhancement-Mode GaN HEMT Design Based on p-GaN Gate Technology and its Reliability Analysis	Electronics
2	Dielectric-Modulated TFET Biosensor for Label-Free Biomolecule Detection	Electronics
3	Night-Time Thermoradiative Solar Cells for Continuous Energy Harvesting	Electronics

37. **Dr. Maruf Ahmed**

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Image reconstruction, Novel approaches, and application of QSM in MRI	CSP
2	Data processing and inference from bio-sensor data	CSP
3	Impact of AI data centers on the electrical grid and mitigation techniques	Power

38. **Dr. Zahir Ahmed**

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Integrated Photonic Devices for Biomedical Applications	Electronics

2	Design and Modeling of Neurophotonic devices for Bio-interfaces	Electronics
3	Photonic Integrated Circuits for Optical Computing	Electronics
Please visit https://sites.google.com/view/zabirahmed/ for additional information		

39. Dr. Md. Sadman Sakib Rahman

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Computational Imaging (e.g., Medical Imaging)	CSP
2	Physics-informed Machine Learning / Deep Learning	CSP
3	Deep Optics / Optical Neural Networks (https://pubs.acs.org/doi/10.1021/acsp Photonics.4c01099)	CSP
4	Applied AI/ML	CSP

40. Dr. Md. Hadiur Rahman Khan

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Ultrasound Elastography Using Physics-Informed Neural Networks	CSP
2	Motion Correction in Medical Imaging using Deep Learning Framework	CSP
3	Medical Image Synthesis and Segmentation Using Generative AI	CSP
4	Forecasting Renewable Energy Generation Using Deep Learning Methods	Power

41. Dr. Md. Irfan Khan

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Design of E-mode HEMT for RF application	Electronics
2	Design of Stacked Nanosheet FET for CMOS Application	Electronics
3	Design of multi layer tandem solar cell	Electronics

42. Dr. Md. Mohsinur Rahman Adnan

Sl. No.	Topic	Group (CSP/Electronics/Power)
1	Multi absorber layer Perovskite solar cell design and simulation in one-dimensional SCAPS-1D and its comparison with two-or three-dimensional FDTD simulations using commercially available/ open-source software. The objective will be to incorporate reflection and transmission effects at layer interfaces along with the absorption behavior within the layers to obtain realistic power conversion efficiency and fill factor parameters that are generally overestimated in simple	Electronics

	one-dimensional all-electronic simulation works done with SCAPS-1D.	
2	Self-consistent simulator design, TCAD model development and analytical model derivation of electrostatic and transport characteristics of novel Field Effect Transistor devices. A few directions of interest will be to incorporate high-K/ferroelectric dielectric materials as gate oxides to move SS beyond 60mV/decade limit, to incorporate two-dimensional materials in the channel region to increase carrier mobility and to increase the number of gates or change the device structure and architecture for better overall electrostatic control.	Electronics
3	Probing excitons, trions and other quasiparticle physics in novel semiconductor materials (wide and ultrawide bandgap three-dimensional semiconductors and chalcogenide based two-dimensional nanosheet structures will be currently focused) to understand their role in absorption and photoresponsivity behavior at the device level (photodiodes and sensors). The objective will be to understand the generation, recombination and dissociation processes of these quasiparticles and to engineer novel electronic, photonic, and optoelectronic applications using their properties within the host materials.	Electronics