

Teerthanker Mahaveer University, Moradabad

Faculty of Engineering

Department of Electrical Engineering

Minutes of BoS Meeting

A meeting of Board of Studies was held in Department of Electrical Engineering, Faculty of Engineering on 14/06/2025. Following points were discussed regarding syllabus and scheme for existing B.Tech. program, session 2025-26. Following members were present in meeting:

1. Prof. Ashwani Kumar, Professor, EE, National Institute of Technology Kurukshetra (External Expert)
2. Prof. Rakesh Kumar Dwivedi, Professor, CSE, FOE, TMU, Moradabad (Nominated Member)
3. Dr. Shubhendra Pratap Singh, HOD, EE, FOE, TMU, Moradabad (Chairperson, BoS)
4. Dr. Debanjan Roy, Assistant professor, EE, FOE, TMU, Moradabad (Member, BoS)
5. Dr. Raghvendra Tiwari, Assistant professor, EE, FOE, TMU, Moradabad
6. Mr. Umesh Singh, Assistant professor, EE, FOE, TMU, Moradabad

List of Agenda Items

1. To design the Vision and Mission of Electrical Engineering Department for the Academic Programs 2025-26.
2. To review and design the Program Educational Objectives (PEOs), Program Outcomes (Pos), Program specific outcomes (PSOs), and Course outcomes (Cos) for the Electrical Engineering Department syllabus of Academic Programs 2025-26.
3. To propose minor/major changes in following courses of B.Tech. EE syllabus.

S.No.	Course Name	Course Code	Type of Change
1	Circuit Theory	EEE312	Major (>20%)
2	Electrical Machine-I	EEE311	Major (>20%)
3	Electrical Measurements and Measuring Instruments	EEE412	Minor (<20%)
4	Network Analysis & Synthesis	EEE413	Minor (<20%)
5	Control System	EEE511	Minor (<20%)
6	Power Electronics	EEE512	Major (>20%)
7	Power System Analysis-I	EEE513	Minor (<20%)
8	Power System Analysis-II	EEE612	Minor (<20%)

9	Electrical Drives & Controls	EEE611	Major (>20%)
10	FACTS Technology	EEE812	Minor (<20%)

4. To propose a value-added course, 'Mitigation of Power Quality Problems by Custom Power Devices Using MATLAB' for BTech and Ph.D. students. This can be considered as a summer training wherever applicable and with a fee of course is decided 2000/- per candidate.
5. To remove the condition of 75% marks in the first year to opt the minor specialization in the B.Tech. Electrical Engineering Honours Programme.
6. Inclusion of certain topics semesters wise to support tinkering lab courses.
7. Inclusion of Stakeholders Feedback & ATR.
8. AAA Audit 2024-25 Proforma (All Criteria)- Signed report discussion.
9. Any other matter with the permission of chair.

The following points were discussed in BoS:

- The department of Electrical Engineering has presented the B.Tech, Electrical Engineering syllabus in respect of newly created Vision and Mission and the BoS expert has recommended the same without any change (**Annexure I**).
- The department of Electrical Engineering has presented the restructured Program Educational Objectives (PEOs), Program Outcomes (Pos), Program specific outcomes (PSOs) and course outcomes (Cos) w.r.to the Bloom's Taxonomy to categorize the educational learning objectives into levels of complexity and specificity for all the courses offered in B.Tech, Electrical Engineering Program and the BoS expert has recommended the same without any change and these are incorporated in the revised syllabus (**Annexure I**).
- The department of Electrical Engineering has presented some major/minor changes of the syllabi of several courses, including Circuit Theory (EEE312), Electrical Machine-I (EEE311), Electrical Measurements and Measuring Instruments (EEE412), Network Analysis & Synthesis (EEE413), Control System (EEE511), Power Electronics (EEE512), Power System Analysis-I (EEE513), Power System Analysis-II (EEE612), Electrical Drives & Controls (EEE611) and FACTS Technology (EEE812) in accordance with current academic and industry requirements. The Board of Studies (BoS) expert has reviewed and recommended these changes without any modifications. The details of all changes is given below and the updated syllabus of courses are given in **Annexure-I**.

- Some major changes found in the syllabus of Circuit Theory (EEE312) are given in the tabular form as:

Subject Name- Circuit Theory Subject Code-EEE312				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics

2	DC Network Theorems: Superposition theorem; Thevenin's theorem; Norton's theorem; Maximum power transfer theorem; Reciprocity theorem; Millman's theorem; Compensation theorem; Tellegen's theorem, Numerical problems based on dependent and independent sources.	Useful topics as per GATE Syllabus for DC circuit analysis	Coupled Circuits: Self Inductance, Mutual Inductance, Coefficient of coupling; Dot rule; Ideal transformer; Effective inductance of coupled coils in series & parallel, Analysis of coupled circuits.	These topics have already covered in the syllabi of EEE117/217 and EEE312 in detail
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- Some major changes found in the syllabus of Electrical Machine-I (EEE311) are given in the tabular form as:

Subject Name- Electrical Machine-I Subject Code-EEE311				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
4	Transformer Construction of transformers, Equivalent Circuit, Phasor Diagram, Voltage Regulation, Losses in Transformers, Open Circuit and Short Circuit Tests, Back-to-Back Test, Transformer Efficiency, Condition for Maximum Efficiency, Parallel operation single-phase transformer. Single Phase Auto Transformer: Volt-ampere Relations, Step-up Auto transformers, Auto Transformer Efficiency, Saving in Copper material, Conversion of Two winding Transformer to an Auto Transformer, Advantages and Disadvantages of Auto Transformer, Applications of Auto Transformers.	Very important to study for students. Earlier it was not in the syllabus.	Transformer: Three-phase transformer Construction; Three-phase unit transformer and Bank of three single-phase transformers with their advantages; Three-phase transformer Groups (Phasor groups) and their connections; Y-Connection, Open delta connection, Three-phase/ 2 phase Scott connection and its application.	Some of these topics are shifted to unit 5 of the syllabus
5	Three-phase Transformer: Construction; Three-phase unit transformer and Bank of three single-phase transformers with their advantages; Three-	These topics are shifted from unit-4 to unit-5.	Three-winding transformers, Tertiary winding.	Not very much relevant.

	phase transformer Groups (Phasor groups) and their connections; DD-YY- YD-DY Connections, Open Delta Connection with application;			
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- Some minor changes found in the syllabus of Electrical Measurements and Measuring Instruments (EEE412) are given in the tabular form as:

Subject Name- Electrical Measurements and Measuring Instruments				
Subject Code-EEE412				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
1	Characteristic of Instruments & Measurement systems: Accuracy, Precision, Resolution and Speed of Response, Sensitivity, Reproducibility, Drift, Dead Zone;	Nothing new but more elaborative and specific compared to various version.	Characteristic of Instruments & Measurement systems;	Its expanded and more elaborated version is added in revised syllabus.
2	Measurement of resistances, Inductance & Capacitance: Measurement of low resistances using Kelvin double-bridge method, Measurement of medium resistances using ohmmeter method and wheat stone bridge method, Measurement of high resistances using direct deflection method and meggar. Measurement of Inductance using Maxwell's Inductance Bridge, Maxwell's Inductance-Capacitance Bridge, Hay's Bridge, Owen's Bridge and Anderson's Bridge & Measurement of Capacitance using De-Sauty's bridge and Schering bridge	Nothing new but more elaborative and specific compared to previous syllabus.	Measurement of resistances, Inductance & Capacitance	Its expanded and more elaborated version is added in revised syllabus.

- Some minor changes found in the syllabus of Network Analysis & Synthesis

(EEE413) are given in the tabular form as:

Subject Name- Network Analysis & Synthesis Subject Code-EEE413				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
2	AC Network Theorems	Useful topics as per GATE Syllabus for AC circuit analysis	DC Network Theorems	These topics have already covered in the syllabus of EEE312
3	None	None	Transient Analysis & initial Conditions.	This topic already covered in unit-5 of EEE312.
5	Hurwitz Polynomial – properties, necessary and sufficient conditions for positive real functions, sturm’s test for positive real functions,	These topics covered the basics of unit-5 and important for students	None	None

- Some minor changes found in the syllabus of Control System (EEE511) are given in the tabular form as:

Subject Name- Control System Subject Code-EEE511				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
2	Effect of adding zero and pole on the control system	Very important topic for understanding the concept of stability	None	None
3	Absolute stability and relative stability	Very relevant to GATE syllabus.	None	None

- Some major changes found in the syllabus of Power Electronics (EEE512) are given in the tabular form as:

Subject Name- Power Electronics Subject Code-EEE512				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics

1	Power Semiconductor Devices: Power semiconductor switches: Power Diode, Power MOSFET, Power IGBT, Power BJT – Static and Switching characteristics. Thyristor operation: V-I characteristics, Turn-On Methods, Two-transistor model, Gate Characteristics, driver circuits, SCRs - series and parallel connections, Operation of GTO, MCT and TRIAC. Protection of devices, Commutation techniques of thyristor.	Nothing new but more elaborative and specific compared to previous syllabus.	Power Semiconductor Devices: Education in Ancient India, Types of power semiconductor devices, their symbols and static characteristics; Characteristics and specifications of switches; Types of power electronic Circuits; BJT operation: Steady state and switch characteristics, Switching limits; Operation and steady state characteristics of MOSFET and IGBT; Thyristor operation: V-I characteristics, Two transistor model, Methods of turn-on; Operation of GTO, MCT and TRIAC.	These topics are presented in better and elaborative way in revised syllabus in sequential way.
2	Phase-Controlled rectifiers: Single-phase half-wave and full wave-controlled rectifiers with R, RL, RLE and RL&FD loads in CCM Mode. Single-phase half-controlled Symmetrical and Asymmetrical bridge rectifiers. Three-phase controlled bridge rectifiers, Three-phase semi-converter. Fourier analysis of source current of single-phase controlled rectifiers. Effect of source impedance, Dual converters.	Unit-3 is shifted to unit 2 and some important topics of GATE exam and having industry relevance are added.	Protection of devices; Series and parallel operation of thyristors; Commutation techniques of thyristor; DC- DC Converters: Principles of step-down chopper, step down chopper with R-L load, Principle of step-up chopper, Operation with RL load, classification of choppers.	Some topics are shifted to unit 1 and some topics are shifted to unit 3 as per requirements.
3	DC- DC Converters: Principles of step-down chopper; step down chopper with R-L load; Principle of step-up chopper; Principles of Buck Converter; Buck Converter with R-L load; Principle of Boost Converter; Buck-Boost Converter, and their design aspects. Fourier analysis and CCM analysis of DC-DC converters.	Some topics of unit-2 are shifted to unit-3 and some very important topics of GATE exam such as Buck, Boost and Buck-Boost converters etc, are added.	Phase Controlled Converters: Single-phase half-wave controlled rectifier with resistive and inductive loads, Effect of freewheeling diode; Single- phase fully-controlled and half-controlled bridge converters	All topics shifted to unit-2

4	Inverters: Single phase bridge inverters; Fourier Analysis of Single-Phase Inverter Output Voltage, Three-phase bridge inverters (120 degree and 180 degree mode of operation), Voltage and harmonic control-PWM Techniques: Multiple PWM and Sinusoidal PWM, Current Source Inverters	Unit-5 is shifted to unit-4 as per requirement. Some importance topics such as PWM Techniques: Multiple PWM and Sinusoidal PWM, Current Source Inverters are added.	AC Voltage Controllers: Principle of on-off and phase control single-phase ac voltage controller with resistive and inductive loads; Three-phase ac voltage controllers (various configurations and comparison); Single-phase transformer tap changer; Cyclo Converters: Basic principle of operation, Single-phase to single-phase, Three-phase to single-phase and three-phase to three-phase cyclo converters, output voltage equation.	Some topics are shifted to unit-5 and some topics having less relevance such as Three-phase ac voltage controllers (various configurations and comparison, Single-phase transformer tap changer are removed.
5	Cyclo-Converters: Basic principle of operation, Single-phase to single-phase, Three-phase to single-phase and three-phase to three-phase cyclo converters, effect of harmonics and Electro Magnetic Interference (EMI). Principle of single-phase and three-phase AC voltage controller with resistive and inductive loads. Applications of power electronics: UPS, SMPS and Drives.	These topics are shifted to this unit from unit-5 as per the requirement.	Inverters: Single phase series resonant inverter; Single phase bridge inverters; Three phase bridge inverters; Voltage control of inverters; Harmonics reduction techniques; Single phase and three phase current source inverters.	These topics are shifted to unit-4 as per the requirement.

- Some minor changes found in the syllabus of Power System Analysis-I (EEE513) are given in the tabular form as:

Subject Name- Power System Analysis-I Subject Code-EEE513				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
1	p.u. System in power system	Very important topic for understanding the basics of power system	None	None

- Some minor changes found in the syllabus of Power System Analysis-II (EEE612)

are given in the tabular form as:

Subject Name- Power System Analysis-II Subject Code-EEE612				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
1	None	None	Symmetrical fault analysis: Calculation of 3-phase short circuit current	This topic shifted to unit-2 to group symmetrical and unsymmetrical faults within same unit
2	Symmetrical fault analysis: Three phase faults, calculation of short circuit MVA	This topic shifted to from unit-1 to unit-2 to group symmetrical and unsymmetrical faults within same unit		

- Some major changes found in the syllabus of Electrical Drives & Controls (EEE611) are given in the tabular form as:

Subject Name- Electrical Drives & Controls Subject Code-EEE611				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
3	Slip power recovery: Static Scheribus drive, Static Kramer Drive, Advantages, Applications, and Problems; Rotor voltage injection method; Vector Control of induction motor.	These topics are shifted from unit-4 to unit-3 to merge the unit 3 and unit 4	Braking of induction motor; Speed control, Stator voltage control, Speed torque characteristics,	These have already covered in Electrical Machine-II (EEE411)
4	Control of Synchronous Motors: Separate control & Self-control of synchronous motors; Operation of self-controlled synchronous motors by VSI and CSI cyclo-converters; Load commutated CSI fed Synchronous Motor, Operation,	Unit-5 shifted to unit-4	None	None

	Waveforms, Speed torque characteristics, Applications, Advantages and Numerical Problems; Closed Loop control operation of synchronous motor drives (Block Diagram Only).			
5	Special Machine Drives: stepper motor: Operation and working principle, control of stepper motors, unipolar and bipolar drive circuits, advantages and applications; Switched Reluctance Motor: Operation and control requirements, converter circuits, modes of operation, advantages and applications; BLDC Motor: Operation and working principle, speed control using inverter and drive circuits, advantages and applications	Useful topics as per GATE Syllabus and these drives have tremendous applications in electric vehicle, robotics etc.	None	None

- Some minor changes found in the syllabus of FACTS (EEE812) are given in the tabular form as:

Subject Name- FACTS Subject Code-EEE812				
Unit Number	New Topics Added	Reason for New Topics Addition	Old Topics Removed	Reason for Removal of old topics
1	Transfer of Active and Reactive Power over a Transmission Line, Uncompensated Transmission, Need for Compensation, Definition and Functions of compensation.	These topics are very important to understand the basic concepts of FACTS.	Power Semiconductor Devices, Perspective on Power Devices, Types of High-Power Devices, Principal High-Power Device Characteristics and Requirements: Voltage and Current Ratings, Losses and Speed of Switching, Parameter Trade-Off of Devices; Power Device Material, Diode (PN	These topics have already covered in course of power electronics (EEE512) in fifth semester.

			Junction) Transistor, MOSFET, Thyristor (without Turn-Off Capability), Gate Turn-Off Thyristor (GTO), Turn-On and Turn-Off Process, MOS Turn-Off Thyristor (MTO), Insulated Gate Bipolar Transistor (IGBT), MOS-Controlled Thyristor (MCT).	
3	None	None	Basic Concept of Voltage-Sourced Converters, Single-Phase Full-Wave Bridge Converter Operation, Single Phase-Leg Operation, Square-Wave Voltage Harmonics for a Single-Phase Bridge,	These topics have already covered in course of power electronics (EEE512) in fifth semester.

- The summary of courses with revisions exceeding 20% is presented in the following table as:

S. No	Name & code of the courses added	Name & code of the courses deleted	Name & code of the courses where revision is more than 20%	Name of the stakeholder from where the inputs have been received	Need /rationale to justify the revision
1	NIL	NIL	Circuit Theory (EEE322 Updated), Electrical Machine-I (EEE321 Updated), Power Electronics (EEE522 Updated) and Electrical Drives & Controls (EEE621 Updated)	Faculty, students, external and academic Professionals	These syllabi have been revised in alignment with the GATE Electrical Engineering syllabus and to meet industry demands in areas such as the electric vehicle industry, energy sector, robotics, and control systems etc.

- The department of Electrical Engineering has proposed a value-added course, **‘Mitigation of Power Quality Problems by Custom Power Devices Using**

MATLAB’ for BTech students. This can be considered as a summer training wherever ap-applicable and with a fee of course is decided 2000/- per candidate. The BoS expert suggests some minor change in the title of proposed course as “**Mitigation of Power Quality Problems Using MATLAB**” and has recommended the same without any change (**Annexure II**).

- The department of electrical engineering has proposed to remove the condition of 75% marks in the first year to opt the minor specialization in the B.Tech. Electrical Engineering Programme. The BoS expert has recommended the same without any change (**Annexure I**).
- The department of electrical engineering has proposed to include the suggested topics as per the Maker Bhawan Foundation (MBF) in all the semesters of BTech program to support tinkering lab course. The BoS expert has recommended the same without any change (**Annexure I**).
- The department of electrical engineering has proposed to incorporate the stakeholders feedback & ATR in the syllabus of BTech academic programs 2025-26 and AAA Audit 2024-25 and Proforma (All Criteria)- Signed report [IQAC Coordinator]. The BoS expert has recommended the same without any change (**Annexure III & IV**).
- The BoS expert suggested to shift the course of Hybrid Electric Vehicles (EEE AE 24 0101) from fourth semester to sixth semester and the course of Artificial Intelligence Techniques (EEE AE 24 0103) from sixth semester to fourth semester in the curriculum of minor specialization offered by department of electrical engineering in “Artificial Intelligence in Electric Vehicle”. The suggestions have been incorporated in revised syllabus. (**Annexure I**)
- The BoS expert suggested to change the name of course of “**Energy Storage**” to “**Energy Storage Systems**” in the curriculum of minor specialization offered by department of electrical engineering in “Application of AI and ML in Energy Engineering”. The suggestions have been incorporated in revised syllabus. (**Annexure I**)
- The BoS expert recommended the removal of the term 'Honours' from the minor specialization programs-Artificial Intelligence in Electric Vehicles or Application of AI & ML in Energy Engineering-offered by the Department of Electrical Engineering. Additionally, award a certificate of minor specialization to students who successfully earn 20 additional credits.

The meeting ended with a vote of thanks.



Dr. Shubhendra Pratap Singh
HoD, EE



Prof. Ashwani Kumar
(External Expert)



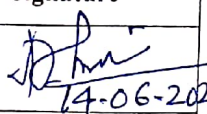
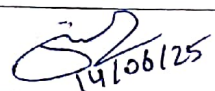
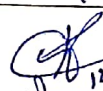
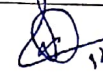
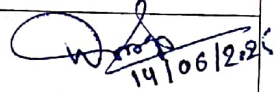
Prof. R. K. Dwivedi
Dean, FOE



Teerthanker Mahaveer University College of Engineering
Attendance Sheet for BoS

Date: 14/06/2025

Department of Electrical Engineering
Attendance Sheet

S. No.	External Expert/Chairperson/Faculty Name	Designation	Signature
1	Prof. Ashwani Kumar	External Expert, Professor	 14-06-2025
2	Prof. Rakesh Kumar Dwivedi	Nominated Member, Professor	
3	Dr. Shubhendra Pratap Singh	Chairperson, Assistant Professor	 14/06/25
4	Dr. Raghvendra Tiwari	Member, Assistant Professor	 14/06/25
5	Dr. Debanjan Roy	Member, Assistant Professor	 14/06/25
6	Mr. Umesh Singh	Member, Assistant Professor	 14/06/25

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