

ACADEMIC LESSON PLAN OF SUMMER 26

Discipline: Electrical	Semester: 6 th (Sec A)	Name of the Teaching Faculty: AKASH BEHERA
Subject: RENEWABLE ENERGY SYSTEMS	No. of days/per week class allotted: 4p/week Tutorial: 1p/week	Semester from: 22.12.2025 to 18.04.2026 No. of weeks: 15 weeks
Week	Class/week	Theory Topics
1 st	1 st	1. Introduction to Renewable energy: 1.1. Introduction
	2 nd	1.1. Environmental consequences of fossil fuel use.
	3 rd	1.2. Importance of renewable sources of energy
	4 th	1.3. Sustainable Design and development.
	5 th	Tutorials
2 nd	1 st	1.4. Types of RE sources.
	2 nd	1.4. Types of RE sources.
	3 rd	Tutorial
	4 th	1.4 Advantages of renewable energy systems
	5 th	1.5. Limitations of RE sources.
3 rd	1 st	1.6. Present Indian and international energy scenario of conventional and RE sources
	2 nd	Tutorial
	3 rd	2. Solar Energy: 2.1. Solar photovoltaic system-Operating principle
	4 th	2.2. Photovoltaic cell concepts
	5 th	2.2.1. Cell, module, array, Series and parallel connections
4 th	1 st	2.2.1 Maximum power point tracking (MPPT).
	2 nd	2.3. Classification of energy Sources.
	3 rd	Tutorial
	4 th	2.4. Extra-terrestrial and terrestrial Radiation
	5 th	2.5. Azimuth angle, Zenith angle, Hour angle
5 th	1 st	2.5 Irradiance, Solar constant
	2 nd	2.6. Solar collectors, Types and performance characteristics
	3 rd	Tutorial
	4 th	2.7. Applications: Photovoltaic - battery charger
	5 th	2.7 domestic lighting, street lighting
6 th	1 st	2.7 water pumping,
	2 nd	2.7 solar cooker
	3 rd	2.7 Solar pond
	4 th	2.7 solar pond floating
	5 th	Tutorials
7 th	1 st	3. Wind Energy: 3.1. Introduction to Wind energy
	2 nd	3.2. Wind energy conversion.
	3 rd	3.3. Types of wind turbines
	4 th	3.3 Types of wind turbines
	5 th	Tutorials
8 th	1 st	3.4. Aerodynamics of wind rotors
	2 nd	3.5. Wind turbine control systems; conversion to electrical power
	3 rd	3.5. Wind turbine control systems; conversion to electrical power
	4 th	Tutorials
	5 th	3.6. Induction and synchronous generators.

9 th	1 st	3.7. Grid connected and self excited induction generator operation
	2 nd	3.8. Constant voltage and constant frequency generation with power electronic control.
	3 rd	3.9. Single and double output systems.
	4 th	3.10. Characteristics of wind power plant.
	5 th	Tutorials
10 th	1 st	4. Biomass Power 4.1. Energy from Biomass.
	2 nd	4.2. Biomass as Renewable Energy Source
	3 rd	4.2 advantages and disadvantages of biomass energy
	4 th	4.3. Types of Biomass Fuels - Solid, Liquid and Gas.
	5 th	Tutorials
11 th	1 st	4.4. Combustion and fermentation.
	2 nd	4.5. Anaerobic digestion.
	3 rd	4.6. Types of biogas digester.
	4 th	4.6. Types of biogas digester.
	5 th	Tutorials
12 th	1 st	4.7. Wood gassifier.
	2 nd	4.8. Pyrolysis,
	3 rd	4.9. Applications: Bio gas, Bio diesel
	4 th	4.9. Applications: Bio gas, Bio diesel
	5 th	Tutorials
13 th	1 st	5. Other Energy Sources 5.1. Tidal Energy: Energy from the tides
	2 nd	5.1 Barrage and Non Barrage Tidal power systems.
	3 rd	5.2. Ocean Thermal Energy Conversion (OTEC).
	4 th	5.2. Ocean Thermal Energy Conversion (OTEC).
	5 th	Tutorials
14 th	1 st	5.3. Geothermal Energy – Classification
	2 nd	5.3. Geothermal Energy – Classification
	3 rd	5.3. Geothermal Energy – Classification
	4 th	5.4. Hybrid Energy Systems.
	5 th	Tutorials
15 th	1 st	5.5. Need for Hybrid Systems
	2 nd	5.6. Diesel-PV, Wind-PV, Microhydel-PV.
	3 rd	5.7. Electric and hybrid electric vehicles.
	4 th	5.7. Electric and hybrid electric vehicles.
	5 th	Tutorial

Akash Behera

Signature of Teaching Faculty

ACADEMIC LESSON PLAN OF SUMMER 26

Discipline: Electrical	Semester: 6 th (SEC-B)	Name of the Teaching Faculty: AKASH BEHERA
Subject: ELECTRIC AL INSTALLA TION AND ESTIMATI NG	No. of days/per week class allotted: 4p/week Tutorial: 1p/week	Semester from: 22.12.2025 to 18.04.2026 No. of weeks: 15 weeks
Week	Class/week	Theory Topics
1 st	1 st	1. INDIAN ELECTRICITY RULES 1.1. Introduction of estimating Basics of estimating, qualities & factor of estimating
	2 nd	1.1 Definitions, Ampere, Apparatus, Accessible, Bare, cable, circuit, circuit breaker, conductor voltage (low, medium, high, EH), live, dead, cut-out, conduit, system, danger, Installation, earthing system, span, volt, switch gear, etc.
	3 rd	1.2 General safety precautions, rule 29, 30, 31, 32, 33, 34, 35, 36, 40, 41, 43, 44, 45, 46.
	4 th	1.3 General conditions relating to supply and use of energy: rule 47, 48, 49, 50, 51, 54, 55, 56, 57, 58
	5 th	Tutorials
2 nd	1 st	1.3 General conditions relating to supply and use of energy 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70.
	2 nd	1.4 OH lines: Rule 74, 75, 76, 77, 78, 79
	3 rd	Tutorials
	4 th	1.4 OH lines: Rule 80, 86, 87, 88, 89, 90, 91
	5 th	Revised of module 1
3 rd	1 st	2. ELECTRICAL INSTALLATIONS 2. 1 Electrical installations, domestics, industrial, Wiring System
	2 nd	2.1 Internal distribution of Electrical Energy.
	3 rd	Tutorial
	4 th	2.1 Methods of wiring, systems of wiring,
	5 th	2.1 wire and cable, conductor materials used in cables, insulating materials mechanical protection. Types of cables used in internal wiring,
4 th	1 st	multi-stranded cables, voltage grinding of cables, general specifications of cables.
	2 nd	2.2 ACCESSORIES: Main switch and distribution boards, conduits, conduit accessories and fittings
	3 rd	Tutorial
	4 th	2.2 lighting accessories and fittings, fuses, important definitions, determination of size of fuse – wire, fuse units
	5 th	2.2 Earthing conductor, earthing, IS specifications regarding earthing of electrical installations, points to be earthed.
5 th	1 st	2.2 Determination of size of earth wire and earth plate for domestic and industrial installations. Material required for GI pipe earthing.
	2 nd	2.3 LIGHTING SCHEME: Aspects of good lighting services. Types of lighting schemes,
	3 rd	Tutorial
	4 th	2.3 design of lighting schemes, factory lighting, public lighting installations, street lighting, general rules for wiring,
	5 th	2.3 determination of number of points (light, fan, socket, outlets), determination of total load, determination of Number of sub- circuits

6 th	1 st	3. INTERNAL WIRING 3.1 Type of internal wiring, cleat wiring, CTS wiring, wooden casing capping, metal sheathed wiring,
	2 nd	3.1 conduit wiring, their advantage and disadvantages comparison and applications.
	3 rd	Tutorial
	4 th	3.2 Prepare one estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plug points.
	5 th	3.2 Prepare one estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plug points.
7 th	1 st	3.2 Prepare one estimate of materials required for CTS wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plug points.
	2 nd	Tutorials
	3 rd	3.3 Prepare one estimate of materials required for conduit wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plug points.
	4 th	3.3 Prepare one estimate of materials required for conduit wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plug points.
	5 th	3.3 Prepare one estimate of materials required for conduit wiring for small domestic installation of one room and one verandah within 25 m ² with given light, fan & plug points.
8 th	1 st	3.4 Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m ² with given light, fan & plug points.
	2 nd	3.4 Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m ² with given light, fan & plug points.
	3 rd	3.4 Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m ² with given light, fan & plug points.
	4 th	3.4 Prepare one estimate of materials required for concealed wiring for domestic installation of two rooms and one latrine, bath, kitchen & verandah within 80m ² with given light, fan & plug points
	5 th	Tutorials
9 th	1 st	3.5 Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m ² and load within 10 KW.
	2 nd	3.5 Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m ² and load within 10 KW.
	3 rd	3.5 Prepare one estimate of materials required for erection of conduct wiring to a small workshop installation about 30m ² and load within 10 KW.
	4 th	Tutorials
	5 th	4. OVER HEAD INSTALLATION 4.1. Main components of overhead lines, line supports, factors Governing Height of pole, conductor materials, determination of size of conductor for overhead transmission line,
10 th	1 st	4.1 cross arms, pole brackets and clamps, guys and stays, conductors

		configurations, spacing and clearances, span lengths, overhead line insulators, types of insulators, lighting arresters, danger plates, anti-climbing devices, bird guards, beads of jumpers, jumpers, tee-offs, guarding of overhead lines.
	2 nd	Tutorials
	3 rd	4.2. Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation
	4 th	4.2. Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation
	5 th	4.2. Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consideration using ACSR.
11 th	1 st	4.3. Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consideration using ACSR.
	2 nd	4.3. Prepare an estimate of materials required for LT distribution line within load of 100 KW maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consideration using ACSR.
	3 rd	Tutorial
	4 th	4.4. Prepare an estimate of materials required for HT distribution line (11 KV) within 2 km and load of 2000 KVA maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consider action using ACSR.
	5 th	4.4. Prepare an estimate of materials required for HT distribution line (11 KV) within 2 km and load of 2000 KVA maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consider action using ACSR.
12 th	1 st	4.4. Prepare an estimate of materials required for HT distribution line (11 KV) within 2 km and load of 2000 KVA maximum and standard spans involving calculation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation of the size of conductor (from conductor chart), current carrying capacity and voltage regulation consider action using ACSR.
	2 nd	Tutorials
	3 rd	5. OVER HEAD SERVICE LINES 5. 1 Components of service lines, service line (cables and conductors), bearer wire, lacing rod. Ariel fuse, service support, energy box and meters etc.
	4 th	5. 2 Prepare and estimate for providing single phase supply of load of 5 KW (light, fan, socket) to a single stored residential building
	5 th	5. 2 Prepare and estimate for providing single phase supply of load of 5 KW (light, fan, socket) to a single stored residential building
13 th	1 st	5. 3 Prepare and estimate for providing single phase supply load of 3KW to each floor of a double stored building having separate energy meter.
	2 nd	5. 3 Prepare and estimate for providing single phase supply load of 3KW to each floor of a double stored building having separate energy meter.
	3 rd	Tutorials
	4 th	5. 4 Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire
	5 th	5. 4 Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using insulated wire
14 th	1 st	5. 5 Prepare one estimate of materials required for service connection to a

		factory building with load within 15 KW using bare conductor and insulated wire combined.
	2 nd	5.5 Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using bare conductor and insulated wire combined.
	3 rd	5. 5 Prepare one estimate of materials required for service connection to a factory building with load within 15 KW using bare conductor and insulated wire combined.
	4 th	Tutorial
	5 th	6. ESTIMATING FOR DISTRIBUTION SUBSTATIONS 6. 1 Prepare one materials estimate for following types of transformer substations 6.1.1 Pole mounted substation
15 th	1 st	6. 1 Prepare one materials estimate for following types of transformer substations 6.1.1 Pole mounted substation
	2 nd	6.1.2 Plinth Mounted substation.
	3 rd	6.1.2 Plinth Mounted substation.
	4 th	6.1.2 Plinth Mounted substation.
	5 th	Tutorial

Akash Behera

Signature of teaching faculty

ACADEMIC LESSON PLAN OF SUMMER 26

Discipline: Electrical	Semester: 4 th	Name of the Teaching Faculty: AKASH BEHERA, BISWANITA SAHOO
Subject: Electrical Estimation and Contracting LAB	No. of days/per week class allotted: 4p/week	Semester from: 22.12.2025 to 18.04.2026 No. of weeks: 15 weeks
Week	Class/week	LAB Topics
1 st	1 st	Prepare a tender notice for purchasing a transformer of 200 KVA for commercial installation.
	2 nd	Prepare a tender notice for purchasing a transformer of 200 KVA for commercial installation.
	3 rd	Prepare a quotation for purchasing different electrical material required
	4 th	Prepare a quotation for purchasing different electrical material required
2 nd	1 st	Prepare a comparative statement for above material Prepare purchase order for the same.
	2 nd	Prepare a comparative statement for above material Prepare purchase order for the same.
	3 rd	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
	4 th	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
3 rd	1 st	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
	2 nd	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
	3 rd	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
	4 th	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
4 th	1 st	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
	2 nd	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
	3 rd	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
	4 th	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
5 th	1 st	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
	2 nd	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
	3 rd	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
	4 th	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
6 th	1 st	Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet.
	2 nd	Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet.

	3 rd	Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet.
	4 th	Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet.
7 th	1 st	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report
	2 nd	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report
	3 rd	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report
	4 th	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report
8 th	1 st	Prepare a tender notice for purchasing a transformer of 200 KVA for commercial installation.
	2 nd	Prepare a tender notice for purchasing a transformer of 200 KVA for commercial installation.
	3 rd	Prepare a tender notice for purchasing a transformer of 200 KVA for commercial installation.
	4 th	Prepare a tender notice for purchasing a transformer of 200 KVA for commercial installation.
9 th	1 st	Prepare a quotation for purchasing different electrical material required
	2 nd	Prepare a quotation for purchasing different electrical material required
	3 rd	Prepare a quotation for purchasing different electrical material required
	4 th	Prepare a quotation for purchasing different electrical material required
10 th	1 st	Prepare a comparative statement for above material Prepare purchase order for the same
	2 nd	Prepare a comparative statement for above material Prepare purchase order for the same
	3 rd	Prepare a comparative statement for above material Prepare purchase order for the same
	4 th	Prepare a comparative statement for above material Prepare purchase order for the same
11 th	1 st	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
	2 nd	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
	3 rd	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
	4 th	Design drawing, estimating and costing of hall / cinema theater / commercial installation. Prepare report and draw sheet.
12 th	1 st	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet.
	2 nd	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
	3 rd	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
	4 th	Design electrical installation scheme for any one factory / small industrial unit. Draw detailed wiring diagram. Prepare material schedule and detailed estimate. Prepare report and draw sheet
13 th	1 st	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
	2 nd	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
	3 rd	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
	4 th	Estimate with a proposal of the electrical Installation of streetlight scheme for small premises after designing
14 th	1 st	Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet
	2 nd	Estimate with a proposal of the L.T. line installation. Prepare report and draw

		sheet
	3 rd	Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet
	4 th	Estimate with a proposal of the L.T. line installation. Prepare report and draw sheet
15 th	1 st	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report
	2 nd	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report
	3 rd	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report
	4 th	Estimate with a proposal of the 500 KVA, 11/0.433 KV outdoor substation and prepare a report

Akash Behera

Signature of Teaching Faculty

ACADEMIC LESSON PLAN OF SUMMER 26

Discipline: Electrical ENGINEERING	Semester: 6 th (SEC-B)	Name of the Teaching Faculty: AKASH BEHERA, SANGITA KUMARI PATRO
Subject: ELECTRICAL WORKSHOP	No. of days/per week class allotted: 2p(3 hour each)/week	Semester from: 22.12.2025 to 18.04.2026 No. of weeks: 15 weeks
Week	Class/week	LAB Topics
1 st	1 st	1. Identification of single core (SC), twin core (TC), three cores (3c), four cores (4c); copper and aluminum PVC, VIR & Weather proof (WP) wire and prepare Britannia T- joint and Married joint.
	2 nd	1. Identification of single core (SC), twin core (TC), three cores (3c), four cores (4c); copper and aluminum PVC, VIR & Weather proof (WP) wire and prepare Britannia T- joint and Married joint.
2 nd	1 st	2. Cutting copper and aluminum cable and crimping lug to them from 2.5mm ² to 6 mm ² cross section
	2 nd	2. Cutting copper and aluminum cable and crimping lug to them from 2.5mm ² to 6 mm ² cross section
3 rd	1 st	3. Connection and testing of fluorescent tube light, high pressure M.V. lamp, sodium vapor lamp, M.H lamp, CFL and latest model lamps – measure inductance, Lux/ lumens (intensity of illumination) in each case-prepare lux table .
	2 nd	3. Connection and testing of fluorescent tube light, high pressure M.V. lamp, sodium vapor lamp, M.H lamp, CFL and latest model lamps – measure inductance, Lux/ lumens (intensity of illumination) in each case-prepare lux table .
4 th	1 st	4. Study battery charger and make charging of lead acid battery (record charging voltage, current and specific gravity).
	2 nd	4. Study battery charger and make charging of lead acid battery (record charging voltage, current and specific gravity).
5 th	1 st	5. Erection of residential building wiring by CTS and conduit wiring system using main two points and test installation by test lamp method and a meggar.
	2 nd	5. Erection of residential building wiring by CTS and conduit wiring system using main two points and test installation by test lamp method and a meggar.
6 th	1 st	6. Fault finding & repairing of Ceiling Fan – prepare an inventory list of parts
	2 nd	6. Fault finding & repairing of Ceiling Fan – prepare an inventory list of parts
7 th	1 st	7. Find out fault of D.C. generator, repair and test it to run.
	2 nd	7. Find out fault of D.C. generator, repair and test it to run.
8 th	1 st	8. Find out fault of D.C. motor starters and A.C motor starter – prepare an inventory list of parts used in different starters
	2 nd	8. Find out fault of D.C. motor starters and A.C motor starter – prepare an inventory list of parts used in different starters
9 th	1 st	9. Dismantle, over haul and assemble a single phase induction motor. Test and run it. – prepare an inventory list.
	2 nd	9. Dismantle, over haul and assemble a single phase induction motor. Test and run it. – prepare an inventory list.
10 th	1 st	10. Dismantle over haul and assemble a three phase squirrel cage and phase wound motor. Test and run them.
	2 nd	10. Dismantle over haul and assemble a three phase squirrel cage and phase wound motor. Test and run them.
11 th	1 st	11. Overhaul a single phase and 3-phase variac.
	2 nd	11. Overhaul a single phase and 3-phase variac.
12 th	1 st	REVISION CLASS

	2 nd	REVISION CLASS
13 th	1 st	REVISION CLASS
	2 nd	REVISION CLASS
14 th	1 st	REVISION CLASS
	2 nd	REVISION CLASS
15 th	1 st	REVISION CLASS
	2 nd	REVISION CLASS

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