Department of Electrical Engineering

B. Tech. Electrical Engineering With Multidisciplinary Minor

UG Scheme & Curriculum - 2023 (NEP 2020)

UG Scheme-2023 (NEP-2020)
B. Tech. Electrical Engineering
With Multidisciplinary Minor
Scheme Summary

Semester	Credits	Hours	Marks	No. of Theory Heads	No. of Practical Heads	Total Heads
I	20	27	525	6	6	12
II	20	26	625	7	5	12
III	20	24	575	6	3	09
IV	20	23	575	8	3	11
V	20	22	575	6	4	10
VI	20	24	500	6	4	10
VII	22	29	575	5	4	9
VIII	20	32	450	1	2	3
Total	162	207	4400	45	31	76

Course Category Credits Summary

Semester Basket		**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**Total Credits**
Basic Science Course	BSC/ESC	6	8	--	--	--	--	--	--	14
Engineering Science Course		8	4	--	--	--	--	--	--	12
Programme Core Course (PCC)	Program Courses	--	2	8	8	10	8	10	--	46
Programme Elective Course (PEC)		--	--	--	--	4	8	4	4	20
Multidisciplinary Minor (MDM)	Multidisciplinary courses	--	--	2	2	4	2	4	--	14
Open Elective (OE) Other than a particular program		--	--	4	2	2	--	--	--	8
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	2	2	--	2	--	2	--	--	8
Ability Enhancement Course (AEC -01, AEC-02)	Humanities	2	--	--	2	--	--	--	--	4
Entrepreneurship/Economics/ Management Courses	Social Science and Management (HSSM)	--	--	2	2	--	--	--	--	4
Indian Knowledge System (IKS)		--	2	--	--	--	--	--	--	2
Value Education Course (VEC)		--	--	2	2	--	--	--	--	4
Research Methodology	Experiential Learning Courses	--	--	--	--	--	--	--	4	4
Comm. Engg. Project (CEP)/Field Project (FP)		--	--	2	--	--	--	--	--	2
Project		--	--	--	--	--	--	4	--	4
Internship/ OJT		--	--	--	--	--	--	--	12	12
Co-curricular Courses (CC)	Liberal Learning Courses	2	2	--	--	--	--	--	--	4
Total Credits (Major)		**20**	**20**	**20**	**20**	**20**	**20**	**22**	**20**	**162**

UG Scheme-2023 (NEP-2020)
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Course Code	Name of Course	Course Category	Teaching Scheme				Credits	Evaluation Scheme					
								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-I													
23BTSHL103EE	Matrices and Differential Calculus	BSC1	2	1	-	3	3	10	15	50	-	-	75
23BTSHL101EE 23BTSHP101EE	Engineering Physics	BSC2	2	1	2	4	3	10	15	50	25		100
23BTEEL101 23BTEEP101	Basic Electrical Engineering	ESC1	3	-	2	5	4	10	15	50	25	-	100
23BTECL107 23BTECP107	Basic Electronics	ESC2	3		2	5	4	10	15	50	25	-	100
23BTEEL1XX 23BTEEP1XX	Vocational & Skill Enhancement Elective-I	VSEC1	1		2	3	2	10	15		25		50
23BTSHL115EE 23BTSHP115EE	Biomedical Engineering	BSC5	2		2	4	3	10	15	50	25	-	100
23BTSHP112EE	Liberal Learning courses I	CC1			4	4	2				25	25	50
			13	**2**	**14**	**28**	**21**	**60**	**90**	**250**	**150**	**25**	**575**

Course Code	Name of Course	Course Category	Teaching Scheme				Credits	Evaluation Scheme					
								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-II													
23BTSHL104EE	Integral Calculus and Differential Equations	BSC3	2	1	-	3	3	10	15	50	-		75
23BTSHL102EE 23BTSHP102EE	Environmental Chemistry	BSC4	1	-	2	3	2	10	15	50	25	-	100
23BTSHL101 23BTSHP101	Communication Skills	AEC1	1		2	3	2	10	15		25		50
23BTITL102EE 23BTITP102EE	Programming for Problem Solving	ESC3	3	-	2	5	4	10	15	50	25	-	100
23BTEEL105	Advanced Electrical Technology	PCC1	2			2	2	10	15	50			75
23BTEEL10X 23BTEEP10X	Vocational & Skill Enhancement Elective-II	VSEC2	1		2	3	2	10	15		25		50
23BTSHL10XEE	Elective: Indian Knowledge System	IKS	2			2	2	10	15	50			75
23BTSHP113EE	Liberal Learning courses II	CC2			4	4	2				25	25	50
			12	**1**	**12**	**25**	**19**	**70**	**105**	**250**	**125**	**25**	**575**

ELECTIVES

23BTSHL10XEE -Elective : Indian Knowledge System -

Course	Course Code (L)	Course Code(P)
Elective: IKS-1- Concepts and Applications inEngineering	23BTSHL109EE	Not Applicable
Elective: IKS-2- Social History of Medicine In Colonial India	23BTSHL110EE	Not Applicable
Elective: IKS-3- Modern Indian Architecture	23BTSHL111EE	Not Applicable

Electrical Board

Course	**Course Code (L)**	**Course Code(P)**
Elective -I : Vocational and Skill Enhancement I-Solar Photovoltaic and Its Applications	23BEEL102	23BEEP102
Elective -I : Vocational and Skill Enhancement-I-Energy Conservation and Audit	23BEEL103	23BEEP103
Elective -I : Vocational and Skill Enhancement- I-	23BEEL104	23BEEP104
Elective -II : Vocational and Skill Enhancement-Foundation of Electric Vehicle and Renewable Energy	23BEEL106	23BEEP106
Elective -II : Vocational and Skill Enhancement-Simulation of Electric Circuit	23BEEL107	23BEEP107
Elective -II : Vocational and Skill Enhancement-	23BEEL108	23BEEP108

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								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-III													
23BTEEL201 23BTEEP201	Sensors and Transducers	PCC2	3	-	2	5	4	10	15	50	25	25	125
23BTEEL202 23BTEEP202	Network Theory	PCC3	3	-	2	5	4	10	15	50	25	-	100
23BTXXLXXX	Multidisciplinary Minor I	MDM1	2	-	-	2	2	10	15	50		-	75
23BTXXLXXX	Open Elective-I	OE1	4		-	-	4	10	15	50	-	-	75
23BTMBL201EE	Engineering Economics and Industrial Management	EEMC 1	2	-		2	2	10	15	50		-	75
23BTHUL2XX	Humanities Elective	VEC1	2	-	-	2	2	10	15	50	-	-	75
23BTEEP203	Minor Project	CEP			4	4	2	-	-	-	50	-	50
TOTAL			**16**	**-**	**08**	**24**	**20**	**60**	**90**	**300**	**100**	**25**	**575**

Offered From Department of Electrical Engineering

Course Code	Name of Course	Course Category
23BTEEL210	Open Elective-I (Non-Conventional energy sources)	OE1
23BTEEL210	Multidisciplinary Minor I (Solar photovoltaic & its Application)	MDM1

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Course Code	Name of Course	Course Category	Teaching Scheme				Credits	Evaluation Scheme					
								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-IV													
23BTEEL204 23BTEEP204	Basic Electrical Machines	PCC4	3	-	2	5	4	10	15	50	25	-	100
23BTEEL205	Electromagnetic Fields	PCC5	3	1	-	4	4	10	15	50	-	-	75
23BTXXLXXX	Multidisciplinary Minor II	MDM2	2	-		2	2	10	15	50		-	75
23BTISL2XX	Open Elective-II	OE2	2	-	-	2	2	10	15	50	-	-	75
23BTEEL2XX 23BTEEP2XX	Vocational & Skill Enhancement Elective-III	VSEC3	1	-	2	3	2	10	15	-	25	-	50
23BTSHL231EE 23BTSHP231EE	Aptitude & Employability Skills	AEC2	1	-	2	3	2	10	15	-	25	-	50
23BTSHL233EE	Universal Human Values 2 : Understanding Harmony	VEC2	2	-		2	2	10	15	50	-	-	75
23BTMBL202EE	Entrepreneurship Development Practices	EEMC 2	2	-		2	2	10	15	50		-	75
TOTAL			**16**	**1**	**06**	**23**	**20**	**80**	**120**	**300**	**75**	**-**	**575**

Offered From Department of Electrical Engineering

Course Code	Name of Course	Course Category
23BTEEL215	Open Elective-II (Foundation of Electric Vehicle)	OE1
23BTEEL209	Multidisciplinary Minor II (Fundamental of Energy Auditing)	MDM2
23BTEEP207	Vocational & Skill Enhancement Elective-III (Introduction To Renewable Energy And Power Station Practice)	VSEC3

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Course Code	Name of Course	Course Category	Teaching Scheme				Credits	Evaluation Scheme					
								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-V													
23BTEEL301 23BTEEP301	AC Machines	PCC6	2	-	2	4	3	10	15	50	25	25	125
23BTEEL302 23BTEEP302	Power Electronics	PCC7	3	-	2	5	4	10	15	50	25	-	100
23BTEEL303	Basic Power System Analysis	PCC8	3		-	3	3	10	15	50	-	-	75
23BTEEL3XX 23BTEEP3XX	Program Elective - I	PEC1	3	-	2	5	4	10	15	50	25	-	75
23BTXXLXXX 23BTXXPXXX	Multidisciplinary Minor-III	MDM3	3	-	2	3	4	10	15	50	25	-	100
23BTISL3XX	Open Elective-III	OE3	2			2	2	10	15	50			75
23BTSHP301	Research Methodology	RM	-	-	4	4	2	-	-	-	25	-	25
TOTAL			**16**	**0**	**12**	**26**	**22**	**60**	**90**	**300**	**125**	**25**	**600**

Offered From Department of Electrical Engineering

Course Code	Name of Course	Course Category
23BTEEL325	Open Elective-III (Fundamentals of Electric Vehicle)	OE1
23BTEEL330/23BTEEP330	Multidisciplinary Minor III (Industrial Electrical System)	MDM3

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Course Code	Name of Course	Course Category	Teaching Scheme				Credits	Evaluation Scheme					
								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-VI													
23BTEEL304 23BTEEP304	Control System Engineering	PCC09	3	-	2	5	4	10	15	50	25	-	100
23BTEEL305 23BTEEP305	Electrical Drives and their Control	PCC10	3	-	2	5	4	10	15	50	25	-	100
23BTXXLXXX	Multidisciplinary Minor- IV	MDM4	2	-	-	2	2	10	15	50	-	-	75
23BTEEL3XX 23BTEEP3XX	Program Elective-II	PEC2	3	-	2	5	4	10	15	50	25	-	100
23BTEEL3XX	Program Elective-III	PEC3	4	-	-	4	4	10	15	50	-	-	75
23BTEEL3XX 23BTEEP3XX	Vocational & Skill Enhancement Elective-IV	VSEC4	1	-	2	3	2	10	15		25		50
23BTSHP302	Research Ethics & Technical Writing	RM	-	-	4	4	2	-	-	-	50	-	50
TOTAL			**17**	**0**	**12**	**28**	**22**	**60**	**90**	**250**	**150**	**-**	**550**

Offered From Department of Electrical Engineering

Course Code	Name of Course	Course Category
23BTEEL322	Vocational & Skill Enhancement Elective-IV (Computer Application in Electrical Engineering)	OE1
23BTEEL331	Multidisciplinary Minor IV (Electrical Power Generation)	MDM4

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Course Code	Name of Course	Course Category	Teaching Scheme				Credits	Evaluation Scheme					
								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-VII													
23BTEEL401 23BTEEP401	Switchgear and protection	PCC11	3	-	2	5	4	10	15	50	25		100
23BTEEL402 23BTEEP402	High Voltage Engineering	PCC12	2	-	2	4	3	10	15	50	25	25	125
23BTEEL403 23BTEEP403	Power System Dynamics	PCC13	2	-	2	4	3	10	15	50	25	-	100
23BTEEL4XX	Program Elective-IV	PEC4	4	-		4	4	10	15	50	-	-	75
23BTXXLXXX	Multidisciplinary Minor V	MDM5	4	-	-	4	4	10	15	50		-	75
23BTEEP404	Project	P	-	-	8	8	4	-	-	-	50	50	100
TOTAL			**15**	**0**	**14**	**29**	**22**	**50**	**75**	**250**	**100**	**75**	**575**

Offered From Department of Electrical Engineering

Course Code	Name of Course	Course Category
23BTEEL415	Multidisciplinary Minor V (Hybrid Electric Vehicle)	MDM5

Course Code	Name of Course	Course Category	Teaching Scheme				Credits	Evaluation Scheme					
								Theory			Practical		Total Marks
			L	T	P	Total Hours		TAE	CAE	ESE	INT	EXT	
SEMESTER-VIII													
23BTEEL4XX	Program Elective-V (MOOCS)	PEC5	4	-		4	4	10	15	50		-	75
23BTEEP405	Internship	I	-	-	24	24	12	-	-	-	200	100	300
TOTAL			**4**		**24**	**28**	**16**	**10**	**15**	**50**	**200**	**100**	**375**

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Vocational & Skill Enhancement Elective Courses

Sr. No.	Code	Course	Credit
Vocational & Skill Enhancement Elective-I			
1	23BTEEL102 23BTEEP102	Solar Photovoltaic & its application	2
2	23BTEEP103 23BTEEP103	Energy Conservation & Audit	2
Vocational & Skill Enhancement Elective-II			
4	23BTEEL105 23BTEEP105	Foundation of Electric Vehicle and Renewable Energy	2
8	23BTEEL106 23BTEEP106	Simulation of Electric Circuit	2
Vocational & Skill Enhancement Elective-III			
6	23BTEEL206 23BTEEP206	Estimation & Costing of Electrical System	2
5	23BTEEL207 23BTEEP207	Renewable Energy & Power Station Practice	2
Vocational & Skill Enhancement Elective-IV			
9	23BTEEL322 23BTEEP322	Computer Application in Electrical Engineering	2
7	23BTEEL323 23BTEEP323	Introduction to Lab View	2

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Tracks for Program Elective Courses

	Course Code	Track-I	Course Code	Track-II	Course Code	Track-III	Course Code	Track-IV	Course Code	Track -V	Course Code	Track VI
Professional Electives with Laboratory												
Professional Elective-I	23BTEEL307	Energy Storage	23BTEEL308	Advanced Electrical Machines	23BTEEL309	Modern Instrumentation	23BTEEL310	Electrical Machine Design	23BTEEL311	PLC SCADA	23BTEEL322	Green Energy Generation
Professional Elective-II	23BTEEL312	Computer Methods in Power System	23BTEEL313	AI Applications to Power System	23BTEEL314	Advanced Power Electronics	23BTEEL315	Electric Vehicles	23BTEEL316	Power Semiconductor Based Drives	23BTEEL323	Fundamentals of Financing for Green Hydrogen Project
Professional Electives												
Professional Elective-III	23BTEEL317	Smart Grid and Its Applications	23BTEEL318	EHVAC& HVDC Transmission	23BTEEL319	Electrical Installation Design	23BTEEL320	Non Linear Control system	23BTEEL321	Substation Engineering	23BTEEL324	Overview of Instrumentation And Control for Green Hydrogen Plant
Professional Elective-IV	23BTEEL406	Flexible AC Transmission System	23BTEEL407	Power Quality	23BTEEL408	Renewable and Distributed Energy Systems	23BTEEL409	Advanced Control Theory	23BTEEL410	Power Electronics for Renewable Energy Systems	23BTEEL415	Green Hydrogen Refueling Station Design
Professional Electives Through NPTEL												
Professional Elective-V (NPTEL)	**NPTEL**											

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Minor Track: Electrical Engineering

Semester	Credits [TH + PR]	Code	Code-Course
III	4	23BTEEL201 23BTEEP201	Sensors and Transducers
	4	23BTEEL202 23BTEEP202	Network Theory
IV	4	23BTEEL204 23BTEEP204	Basic Electrical Machines
	4	23BTEEL205	Electromagnetic Fields
V	3	23BTEEL301 23BTEEP301	AC Machines
	4	23BTEEL302 23BTEEP302	Power Electronics
	3	23BTEEL303	Basic Power System Analysis
VI	4	23BTEEL304 23BTEEP304	Control System Engineering
	4	23BTEEL305 23BTEEL305	Electrical Drives and their Control
VII	4	23BTEEL401 23BTEEP401	Switchgear and protection
	4	23BTEEL402 23BTEEP402	High Voltage Engineering
	4	23BTEEL403 23BTEEP403	Power System Dynamics

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Multidisciplinary Minor Courses

Semester	Credit	Code	Code-Course
III	2	23BTEEL102 23BTEEP102	Solar Photovoltaic & its application
		23BTEEP103 23BTEEP103	Energy Conservation & Audit
IV	2	23BTEEL105 23BTEEP105	Foundation of Electric Vehicle and Renewable Energy
		23BTEEL208	Linear Network Theory
V	4	23BTEEL304 23BTEEP304	Control System Engineering
		23BTEEL302 23BTEEP302	Power Electronics
VI	2	23BTEEL206 23BTEEP206	Estimation & Costing of Electrical System
VII	4	23BTEEL315	Electric Vehicle