



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
Kakinada-533003, Andhra Pradesh (India)

**Comparison of Program Structure R19 with R20**

Program Code	Program Name	Total No. of Courses		No of Subjects			Total Courses	Percentage %
		R19	R20	Added in (R20)	Deleted (R19)	Content revised more than 20%		
1A02	B.Tech – Electrical & Electronics Engineering	103	97	18	18	2	38	39

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# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

Kakinada-533003, Andhra Pradesh (India)

## Comparison of Course Structure R19 with R20

Program Code: 1A02

Program Name: B.Tech–Electrical & Electronics Engineering

Year : 1

Semester: 1

R19					R20					Remarks				
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
1	Mathematics - I	3			3	BSC	Mathematics – I (Calculus)	3			3			5
2	Communicative English	3			3	BSC	Mathematics – II (Linear Algebra and Numerical Methods)	3			3			10
3	Applied Chemistry	3			3	HSMC	Communicative English	3			3		yes	
4	Fundamentals of Computers	3			3	ESC	Programming for Problem Solving Using C	3			3		yes	20
5	English communication skills Lab - I			2	1	ESC	Thermal and Hydro Prime Movers	3			3			
6	Applied Chemistry Lab			3	1.5	HSMC	English Communications Skills Lab			3	1.5		yes	20
7	IT Workshop			2	1	BSC	Electrical Engineering Workshop Lab			3	1.5		yes	
8	Electrical Engineering Workshop			2	1	ESC	Programming for Problem Solving Using C Lab			3	1.5			10
9	Environmental Science	3			0	MC	Physical Fitness Activities			2	0	0		
10	Physical Fitness Activities	2			0									
<b>TOTAL</b>					16.5	<b>TOTAL</b>					19.5		4	0

Program Code: 1A02

Program Name: B.Tech – Electrical &amp; Electronics Engineering

Year : 1

Semester: 2

R19					R20					Remarks				
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
1	Mathematics - II	3			3	BSC	Mathematics – III (Transforms, PDE and Vector Calculus)	3			3			20
2	Mathematics - III	3			3	BSC	Applied Physics	3			3			
3	Applied Physics	3			3	ESC	Data Structures Through C	3			3			10
4	Problem Solving and Programming using C	3			3	ESC	Electrical Circuit Analysis –I	3			3			
5	Electrical Circuit Analysis - I	3			3	ESC	Engineering Drawing	3			3			
6	Engineering Drawing	1		3	2.5	ESC	Thermal and Hydro Prime Movers Lab			3	1.5			
7	English Communication Skills Lab- II			3	1.5	BSC	Applied Physics Laboratory			3	1.5		yes	
8	Applied Physics Lab			3	1.5	ESC	Data Structures through C Lab			3	1.5			10
9	Physics Virtual Lab			2	0	BSC	Applied Physics Virtual Laboratory			2	0			
10	Problem Solving and Programming using C Lab			3	1.5	MC	Constitution of India	2			0			
11	Engineering Exploration Project - Design Thinking (15 Hrs per Sem.)				0.5	MC	Engineering Exploration Project- Design Thinking			1	0			
12	Constitution of India	3			0							0		
<b>TOTAL</b>					22.5	<b>TOTAL</b>					19.5		1	0

Program Code: 1A02

Program Name: B.Tech – Electrical &amp; Electronics Engineering

Year : 2

Semester: 1

R19					R20					Remarks								
Course code	Course name	L	T	P	C	Course code	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %				
1	Electronic Devices and Circuits	3			3	BSC	Mathematics – IV (Complex Variable and Statistical Methods)	3			3	Yes						
2	Thermal and Hydro Prime Movers	2			2	PCC	Electronic Devices and Circuits	3			3			10				
3	Digital Electronics	3			3	PCC	Electrical Circuit Analysis –II	3			3			10				
4	Electrical Circuit Analysis –II	3			3	PCC	DC Machines and Transformers	3			3			10				
5	Electrical Machines-I	3			3	PCC	Electro Magnetic Fields	3			3							
6	Electro Magnetic Fields	3			3	PCC	DC Machines and Transformers Lab			3	1.5							
7	Power System-I	3			3	PCC	Electrical Circuits Lab			3	1.5							
8	Electrical Circuits Lab			3	1.5	PCC	Electronic Devices and Circuits lab			3	1.5							
9	Thermal and Hydro Lab			2	1	SC	Skill oriented course-Design of Electrical Circuits using Engineering Software Tools			4	2	yes						
10	Essence of Indian Traditional Knowledge	3			0	MC	Essence of Indian Tradition Knowledge	2			0							
11	Employability Skills-I	3			0								yes					
<b>TOTAL</b>							22.5	<b>TOTAL</b>							21.5	2	1	0

Program Code: 1A02

Program Name: B.Tech – Electrical &amp; Electronics Engineering

Year : 2

Semester: 2

R19					R20					Remarks				
Course code	Course name	L	T	P	C	Category	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
1	Signals and Systems	3			3	ESC	Python Programming	3			3		yes	
2	Managerial Economics & Financial Analysis	3			3	PCC	Digital Electronics	3			3			
3	Electrical Machines-II	3			3	PCC	Power System-I	3			3			10
4	Control Systems	3			3	PCC	Induction and Synchronous Machines	3			3			10
5	Electrical Measurements and Instrumentation	3			3	HSMC	Managerial Economics & Financial Analysis	3			3			
6	Electrical Machines Lab -I			3	1.5	ESC	Python Programming Lab			3	1.5	Yes		
7	Electronic Devices & Circuits Lab			3	1.5	PCC	Induction and Synchronous Machines Lab			3	1.5			
8	Electrical Simulation Lab			2	1	PCC	Digital Electronics Lab			3	1.5	yes	yes	
9	Professional Ethics and Human Values	3			0	SC	Soft skill course- Employability Skills	2			2	yes	yes	20
10	Socially Relevant Projects- I			1	0.5								yes	
	<b>TOTAL</b>				19.5		<b>TOTAL</b>				21.5	3	4	0
							Minors Course*	4			4			
							Honors Course*	4			4			

R19						R20						Remarks		
Course code	Course name	L	T	P	C	Category	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
1	Power Systems-II	3			3	PCC	Power Systems-II	3			3			30
2	Power Electronics	3			3	PCC	Power Electronics	3			3			10
3	Linear IC Applications	3			3	PCC	Control Systems	3			3			10
4	Digital Signal Processing	3			3	OEC	Open Elective- I/ Job Oriented Elective-I 1. Renewable Energy Sources 2. Energy Auditing. Conservation and Management 3. Optimization Techniques 4. Basics of Control Systems	3			3	yes		10
5	Program Elective -I 1. Python Programming 2. Data Structures 3. OOPS through JAVA 4. Operating Systems	3			3	PEC	Professional Elective - I 1. Switchgear and Protection 2. Utilization of Electrical Energy 3. High Voltage Engineering 4. Renewable and Distributed Energy Technologies	3			3	yes		10
6	Electrical Machines –II Laboratory			3	1.5	PCC	Control Systems Lab			3	1.5			
7	Control Systems Laboratory			3	1.5	PCC	Power Electronics Lab			3	1.5			
8	Electrical Measurements and Instrumentation Laboratory			3	1.5	SC	Skill advanced course- Courses offered by Siemens Centre of excellence : AUTOMATION LAB- Basics of PLC, Basics of SCADA/ ELECTRICAL & ENERGY STUDIES LAB- Basics of Low Voltage Switchgear, Basics of Induction Motor/			4	2	yes		

						PROCESS INSTRUMENTATION LAB- Basics of Process Instrumentation							
9	Socially Relevant Projects-II			1	0.5	MC	Environmental Science	2		0		yes	
10	Employability Skills-II	3			0	PROJ	Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester			1.5	yes	yes	
	Total				20		Total			21.5	4	2	1
							Minors Course*	4		4			
							Honors Course*	4		4			

R19					R20					Remarks				
Course code	Course name	L	T	P	C	Category	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
1	Electric Drives	3			3	PCC	Microprocessors and Microcontrollers	3			3			5
2	Power System Analysis	3			3	PCC	Electrical Measurements and Instrumentation	3			3			5
3	Microprocessors and Microcontrollers	3			3	PCC	Power System Analysis	3			3			25
4	Open Elective-I 1. Renewable Energy Sources 2. Energy Auditing, Conservation and Management 3. Optimization Techniques	3			3	PEC	Professional Elective - II 1. AI Applications in Electrical Engineering 2. Flexible Alternating Current Transmission Systems 3. Electrical Distribution Systems 4. Electric Drives	3			3			10
5	Program Elective –II 1. Energy Auditing Conservation and Management 2. Electrical Distribution Systems 3. Renewable Energy Technologies 4. Special Electric Machines	3			3	OEC	Open Elective –II/ Job Oriented Elective-II 1. Neural Networks and Fuzzy Logic 2. Basics of Power Systems and Power Quality 3. Basics of Electrical Measurements 4. Indian Electricity Act-2003	3			3	Yes	Yes	10
6	Program Elective –III 1. IoT Applications in Electrical Engineering 2. Data Base Management Systems 3. Data Analytics with Python 4. Cloud Computing	3			3	PCC	Electrical Measurements and Instrumentation Lab			3	1.5			



7	Power Electronics Laboratory			3	1.5	PCC	Microprocessors and Microcontrollers Lab			3	1.5			
8	Linear IC Applications Laboratory			3	1.5	PCC	Power Systems and Simulation Lab			3	1.5		yes	
9	Value Education	3			0	SC	Skill advanced course- High Voltage Lab			4	2	Yes	yes	
10						MC	Research Methodology	2				Yes		
	<b>TOTAL</b>				21		<b>TOTAL</b>				21.5	3	3	1
							Minors Course*	4			4			
							Honors Course*	4			4			

R19					R20					Remarks				
Course code	Course name	L	T	P	C	Category	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
1	Switchgear and Protection	3			3	PEC	Professional Elective – III 1. Digital Signal Processing 2. Linear IC Applications 3. Programmable Logic Controllers and Applications 4. Optimization Techniques	3			3	yes		5
2	Power System Operation and Control	3			3	PEC	Professional Elective – IV 1. Object Oriented Programming through Java 2. Data Base Management Systems 3. Cloud Computing 4. Operating Systems	3			3			5
3	Program Elective -IV 1. HVDC Transmission 2. EHVAC Transmission 3. Flexible Alternating Current Transmission Systems 4. High Voltage Engineering	3			3	PEC	Professional Elective – V 1. Power System Operation and Control 2. Switch Mode Power Conversion 3. Advanced Control Systems 4. IoT Applications in Electrical Engineering	3			3			5
4	Program Elective -V 1. Utilization of Electrical Energy 2. Smart Grid Technologies 3. Power System Deregulation 4. Hybrid Electric Vehicles	3			3	OEC	Open Elective- III /Job Oriented Elective-III 1. Basics of Microprocessors and Microcontrollers 2. Fundamentals of utilization of Electrical Energy 3. Electrical Estimation and Costing 4. Introduction to Internet of Things	3			3	Yes		5
5	Open Elective-II	3			3	OEC	Open Elective-IV /Job	3			3	Yes		5

	1. AI Techniques and its Applications 2. Linear Control Systems 3. Measurements and Instrumentation						Oriented Elective-IV 1. Concepts of Power System Engineering 2. Fundamentals of Electric Vehicles 3. Introduction to Machine Learning 4. Introduction to Smart Grid							
6	Microprocessors and Microcontrollers Laboratory		3	1.5	HSMC		Universal Human Values-2: Understanding Harmony	3			3			
7	Power Systems and Simulation Laboratory		3	1.5	SC		Skill Advanced course IoT Applications in Electrical Engineering			4	2	Yes		
8	Industrial Training /Skill Development Programmes / Research Project		2	1	PROJ		Industrial / Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII Semester)			2	3	Yes		
9	Project-Work Phase -I		4	2									yes	
10	Universal Human Values 2: Understanding Harmony	3		0										
	<b>TOTAL</b>	15		12	21		<b>TOTAL</b>				23	5	1	0
							Minors Course*	4			4			
							Honors Course*	4			4			

Program Code: 1A02

Program Name: B.Tech – Electrical &amp; Electronics Engineering

Year : 4

Semester: 2

R19					R20					Remarks				
Course code	Course name	L	T	P	C	Category	Course name	L	T	P	C	New Course? (R20)	Deleted Course? (R19)	Content Revision %
1	Program Elective –VI 1. AI Applications in Electrical Engineering 2. VLSI Design 3. Cyber Security 4. Electrical Machine Design	3			3	PROJ	Project work, seminar and internship in industry (6 Months)				12	yes	yes	
2	Program Elective -VII 1. Switch Mode Power Conversion 2. Embedded Systems 3. Programmable Logic Controllers & its Applications 4. Communication Systems	3			3									
3	Open Elective-III 1. Microprocessors and Microcontrollers Applications 2. Fundamentals of utilization of Electrical Energy 3. Electrical Estimation and Costing	3			3									
4	Project-Work Phase -II	0		16	8								yes	
	<b>TOTAL</b>	9		16	17		<b>TOTAL</b>				12	1	2	0